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AMERICAN VETERINARY MEDICAL ASSOCIATION



In This Issue

GENERAL ARTICLES

- Radioactive Isotopes as Research Tools—*J. W. Buchta*..... 321
The Necessity for Research on Foot-and-Mouth Disease—*William A. Hagan* 327
Foot-and-Mouth Disease Situation 332

SURGERY AND OBSTETRICS

- Sterilization—Aseptic Technique in Veterinary Practice—*Mark W. Allam* 338
Third Cesarean Section on a 2-Year-Old Cat—*Salo Jonas*..... 342
Dilatation of the Esophagus in a Cocker Spaniel—*Robert H. Fitts*..... 343
A Newly Developed Anesthetic for Large Animals—*E. W. Millenbruck*.. 345

CLINICAL DATA

- Diseases and Ailments in Suckling Pigs—Report of the Committee..... 349
The Significance of Hypoglycemia—*Jesse Sampson*..... 350
Brucellosis Survey at Cincinnati Annual Meeting—*Raymond Fagan*..... 353
The Pathology of So-Called Acute Tonsillitis of Dogs in Relation to Contagious Canine Hepatitis (Rubarth)—*D. L. Coffin*..... 355
Observation on the Use of Sodium Fluoride as an Ascaricide in Swine—*R. D. Turk and Fred Hale*..... 363
Veterinary Allergy—*A. F. Coca*..... 366
Malignant Meningioma in a Dog—*C. L. Davis, Lee R. Phillips, and Karl T. Neuburger* 367
Lead Poisoning in Calves—*J. W. Bailey*..... 370
The Action of Penicillin In-Vitro on Organisms Found in Bovine Mastitis—*H. F. Farrag*..... 371
Report on Streptomycin in Mastitis—*Arthur Lipman*..... 377
Anthrax in American Bison "Bos Bison L"—*David C. McNary*..... 378
Rabies in a Steer—*J. W. Bailey*..... 379
Rabies in Indiana—*R. Fagan*..... 380
Sulfamethazine Blood Concentrations in Horses—*C. R. Schroeder, Mark Welsh, Peter H. Langer, and Robert L. Burkhart*..... 381
Experimentally Developed Telangiectasis and Sawdust Liver Lesions in Rats—*Irene Rosenfeld and O. A. Beath*..... 386

NUTRITION

- Reduce Pig Losses by Better Nutrition and Management—Report of the Committee 392

EDITORIAL

- Who Should Pay for Federal Meat Inspection?..... 395

(Contents continued on ad pages 2 and 4)

Volume CXII

MAY, 1948

Number 854



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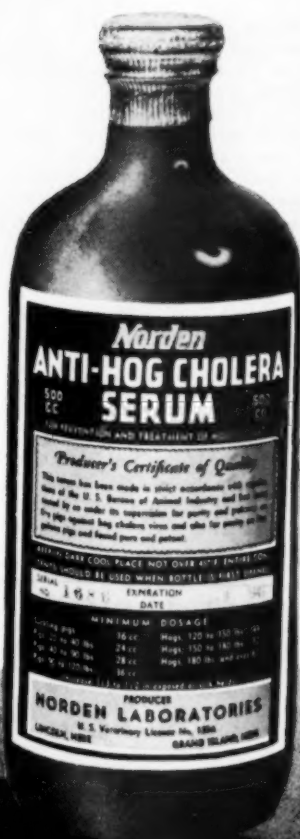
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CONTENTS

(Continued from Cover)

SURGERY AND OBSTETRICS

Fertility at High Altitudes.....	342
The American Society for the Study of Sterility.....	344
Castration of a Tiger Improves Ferocious Temperament.....	347

CLINICAL DATA

Streptomycin	348
Pneumoencephalitis Vaccine	348
Theory on Malignancy	348
Potato-Stalk Poisoning	348
Salmonella Pullorum in Eggs.....	348
Keep the Brooder-House Stove Burning.....	348
Bone Marrow in Laboratory Work.....	348
Commercial Fertilizer vs. Livestock.....	348
Roundworm Treatment for Kittens.....	348
Sulfadiazine and Streptomycin in Human Brucellosis.....	349
Pathogenesis of Brucellosis.....	349
Dominant Mink Diseases.....	349
Equine Leptospirosis	352
"Slobbers" in Chinchillas.....	354
Colchicine in Mammary Tumors.....	354
Canada Prohibits Hormone Tenderizing of Poultry.....	362
Anthrax in Two Circus Tigers.....	366
"Blue Baby" Disease in Dogs.....	370
Procaine Penicillin Gives Double Advantage.....	370
Paratyphoid Dysentery in Sheep.....	374
Corrigenda for Hog Cholera Article in March Journal.....	374
Penicillin in Demodectic Mange.....	376
Shifts Lambing Season from Spring to Autumn.....	376
Clinical Pathology	378
Curable Rabies	379

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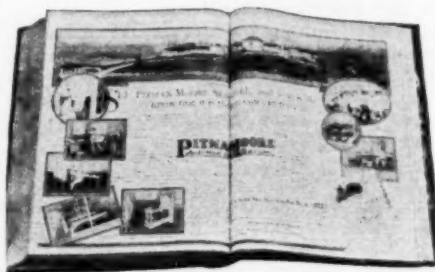
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Way back when a button-hook
was a necessary instrument
in the kit of every veterinarian—
not only to button his shoes
but—in the hands
of the elite
small animal surgeon—
to use in canine ovariectomies
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CONTENTS - Continued

Intralingual Antirabic Treatment.....	379
Diagnosis of Rabies by Saliva Inoculation.....	380
Penicillin in Bovine Infectious Keratitis.....	385
Results of Federal-State Brucellosis Program.....	389
The Camel and Its Diseases (A Book Review).....	390
Penicillin in Canine Leptospirosis.....	390
Shipping Canine Tissues.....	391
Natural Immunity to Foot-and-Mouth Disease.....	391
Bruise Loss High in Hogs.....	391
Chlordane, a Promising Insecticide.....	391

NUTRITION

Relation of Cobalt Insufficiency to Ketosis.....	393
Feed for Sows.....	393
Thiamin in Calf Nutrition.....	393
Vitamin Levels in Colostrum.....	394
Powdered Egg Shells.....	394
New Views on Cobalt Therapy.....	394

EDITORIAL

Foot-and-Mouth Disease Research.....	395
State Official Objects to "Plain Talk" Editorial.....	396
Important Notice re Veterinary Corps Commissions.....	396
Advertising Drugs.....	397

CURRENT LITERATURE

ABSTRACTS

Mucoid Brucella Vaccine, 398; The Present and Future Aspects of Military Veterinary Medicine, 398; Infectious Anemia Virus Present in Horse Serum, 398; Russian Veterinary Colleges, 399; Venipuncture, 400; Secondary Suture of Granulating Wounds, 400; Phenothiazine in Canine Parasitism, 401; A Survey of Literature from Holland, 401; Leucemia in a Cow, 401.

BOOKS AND REPORTS

Reactions of Animals to Heat, 402; Mycopathologia, 402; Experimental Air-Borne Infection, 402; Annual Report, 402; Tanganyika Veterinary Report, 402; Amino Acids and Proteins, 403; Colloid Science, 403; Index of Diagnosis, 403; Cadernos Cientificos, 403.

THE NEWS

Advance Reservations Point to Big Attendance at San Francisco.....	404
The AVMA Rabies Exhibit at AMA Interim Meeting.....	406
Twenty-Five Constituent Associations Broadcast Livestock Health Programs.....	406
Proposed Amendments to Constitution, Administrative By-Laws, and Code of Ethics.....	408
Dr. Newsom President Colorado A. & M. College.....	409
Program of Section on Tropical Veterinary Medicine.....	410
American Animal Hospital Association.....	411
The San Francisco Convention Program.....	411
Student Chapter Activities.....	412
Applications.....	412
U. S. Government.....	414
Among the States and Provinces.....	415
Foreign.....	422
State Board Examinations.....	424
Coming Meetings.....	424
Veterinary Military Service.....	425
Marriages.....	427
Births.....	428
Deaths.....	428

MISCELLANEOUS

The "Wonder Drugs," 326; Zinc Sulfophenate in Canine Otitis, 326; Shipping Milk, 326; Unconquered Foes, 331; Anartuberculin, 331; Observations on Foot-and-Mouth Disease in Mexico, 334; Highlights of Congressional Hearings, 334; Foot-and-Mouth Disease in Wildlife, 337; When F-and-M Strikes, 337; Some Facts about the Tuberculosis Mortality, 337.	
<i>And Related Topics.....</i>	26

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Radioactive Isotopes as Research Tools

J. W. BUCHTA, Ph.D.

Minneapolis, Minnesota

RADIOACTIVE isotopes open new fields of research in the biologic sciences which may be as fruitful in results as those opened by the invention of the compound microscope. It will require some years for us to evaluate the results of the new techniques and tools, but each day we learn of new applications of isotopes as tracers.

To understand the possibilities of the tools, we shall need to review our present day ideas of atomic structure. The constituent parts of the atom which will be of interest to us are the electron, the proton, and the neutron.

STRUCTURE OF THE ATOM

The electron is the fundamental particle of negative electricity. Its mass or weight is so small in comparison to the mass of the other particles that for our purposes we may neglect it in determining the total mass of the atom.

The proton is a fundamental particle which carries a positive charge of electricity equal in magnitude to that of the electron—but opposite in sign. Its mass or weight we shall take as unity—on this scale the oxygen atom has the mass of 16 usually assigned to it by the chemist.

The neutron has practically the same mass as that of the proton* but it has zero charge.

*Throughout this paper we shall not deal with fractional atomic weights nor concern ourselves with the so-called packing fraction. All atomic weights will be given in whole numbers.

Presented before the Fourth General Session, Eighty-fourth Annual Meeting, American Veterinary Medical Association, Cincinnati, Ohio, Aug. 18-21, 1947.

Professor and chairman, Department of Physics, University of Minnesota, Minneapolis.

By combining these three particles in the proper manner, we can, at least on paper, construct any of the atoms on the chemist's list of 92 (or 96) elements. Each atom consists of a nucleus containing protons and neutrons, and in orbits relatively far out from the nucleus are electrons whose total electrical charge just balances that of the protons.

The simplest atom of all is hydrogen. Its nucleus contains 1 proton and in an orbit about this nucleus 1 electron revolves. Its mass or weight is thus approximately unity on the scale we are using.

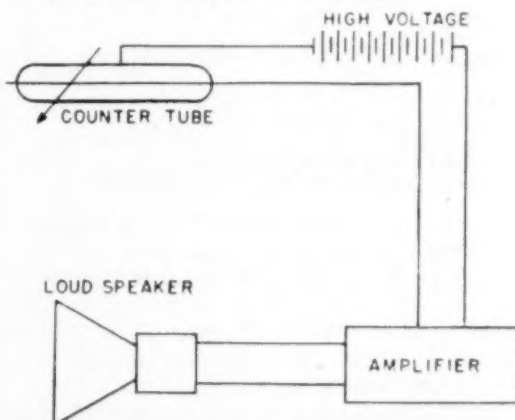


Fig. 1—Schematic diagram of the Geiger counter. The high voltage and controls are normally supplied by electronic tube devices.

The next atom in the chemist's list is helium. The nucleus of helium contains 2 protons and 2 neutrons. There are 2 electrons in orbits about the nucleus. The atomic weight of helium is therefore, approximately 4. Thus, we may build up atoms of any of the elements found on the

earth. Carbon, for example, has a nucleus containing 6 protons and 6 neutrons, and, as always, the number of electrons in outer orbits or as a cloud surrounding the nucleus is equal to the number of protons within the nucleus. The number of protons is not always equal to the number of neutrons. Except for the lighter elements, the number of neutrons is greater than the number of protons. For example, in iodine there are 53 protons and 74 neutrons. The heaviest atom found in nature is uranium with 92 protons and 146 neutrons.

The structure of atomic nuclei is indicated by a modern method of writing symbols for them. For example, the notation for the elements named above is ${}^1_1\text{H}^1$, ${}^4_2\text{He}^4$, ${}^{12}_6\text{C}^{12}$, ${}^{127}_{53}\text{I}^{127}$, ${}^{238}_{92}\text{U}^{238}$. The common chemical symbols for hydrogen, helium, carbon, iodine, and uranium are used but, in addition,

The chemical properties depend upon the number and arrangement of outer electrons and not essentially upon the nucleus. It was discovered some years ago by J. J. Thompson of England that all atoms of a given element were not alike even though they exhibited identical chemical behavior. It was found, for example, that there are atoms of carbon with 6 neutrons and 6 protons, but also a few with 6 protons and 7 neutrons. All oxygen atoms have 8 protons, but some have 8 neutrons, some 9, and some 10 neutrons. Chemically, we may consider these atoms of oxygen identical. All have the same outer electronic arrangements but their nuclei have different numbers of neutrons. Such atoms are called isotopes.

Biologic processes appear to be essentially chemical in nature, and since the chemical behavior of 1 isotope of a given

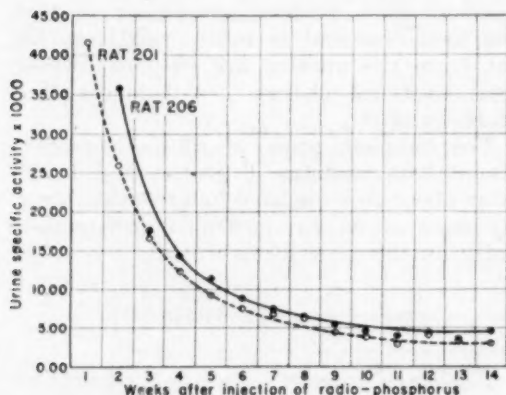


Fig. 2—Amounts of radiophosphorus that appear in the urine of a rat after a single injection.

tion, subscripts are attached which indicate the number of protons in the neutrons and superscripts are used to indicate the total number of protons and neutrons in the atom. The subscripts are often called atomic numbers. The superscripts indicate the atomic weights.

One should emphasize the relative size of the nucleus and the outer orbits or clouds of electrons. The outer orbits or clouds of electrons about the nucleus determine the dimensions that are ordinarily assigned to an atom. If one enlarged the atom so that the electronic orbits were 1 ft. in diameter, the nucleus would still be less than .001 in. in diameter. It is this very small nucleus that contains practically all of the mass of the atom and which is all important for the topic of this paper.

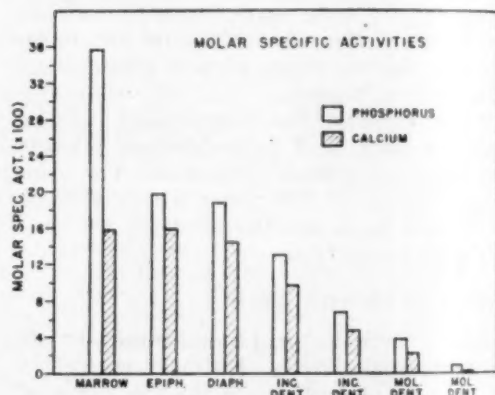


Fig. 3—Amounts of radiophosphorus and radiocalcium that were found in organs of rat destroyed five days after injection.

element is the same as that of another, we may expect isotopes to undergo identical treatment in biologic cells. It is fundamental to the use of isotopes, both radioactive and stable, that their presence does not alter the normal biologic activities and that they enter such activities in the same manner as other isotopes of the given element.

RADIOACTIVITY

Natural radioactivity occurs in a number of heavier elements. Radioactive processes involve changes in the nucleus of the atom. A nucleus spontaneously disintegrates. A common process is ejection of an alpha particle at a high velocity. This particle is just the helium nucleus, a combination

of 2 protons and 2 neutrons. Radium itself disintegrates in this manner. After the emission of the *alpha* particle, the remaining nucleus is found to be reduced in charge and weight. One may say that two new elements have been formed according to the following equation:



The initial radium (Ra) atom had 88 protons and 138 neutrons in its nucleus. Its total weight was 226 units. The radon (Rn) produced by the disintegration process contains 86 protons and 136 neutrons,—atomic weight of 222.

The rate of decay of radioactive elements does not seem to be subject to our control. In any chemical combination, under any temperature or pressure conditions that we may impose, the rate of disintegration does not change. Starting with a given number of radium atoms, it would be found that in slightly more than 1,600 years one half of them had disintegrated, and in another 1,600 years one half of the remaining half would have disintegrated. We, therefore, speak of the "half life" of radium as being approximately 1,600 years. The radon produced by the disintegration of radium has a half life of only three and eight-tenths days. The half lives of other radioactive products vary from a fraction of a second to millions of years.

The number of radioactive elements found in nature is relatively small. Very few of these elements have much interest to the biologist. The amounts of the elements that display appreciable activity, that is, have relatively short lives, which the chemist or physicist can acquire are small. Thus, naturally occurring radioactive elements were in the past used mainly for the action of the radiation from them. In addition to the ejection of an *alpha* (He) particle, some elements emit *beta* rays which are high speed electrons produced as a result of a reaction in the nucleus in which a neutron is converted into a proton and an electron. Accompanying these *beta* rays, we often find *gamma* rays—very short and highly penetrating x-rays. These radiations are of value in the treatment of malignant growths.

The phenomenon of radioactivity appears to be the result of a certain instability of nuclei and, therefore, it is not surprising to find radioactivity in nature

restricted to the heavy and complex nuclei. In general, one may say that the number and arrangement of fundamental particles in the nucleus determine the stability. In 1934, Irene Curie and her husband, F. Joliot, announced the discovery of induced radioactivity. They found that when some of the common elements which are ordinarily stable, such as aluminum, boron, and magnesium, were bombarded by *alpha* particles a radioactivity was induced in the materials and maintained itself for some time after the bombardment had ceased.

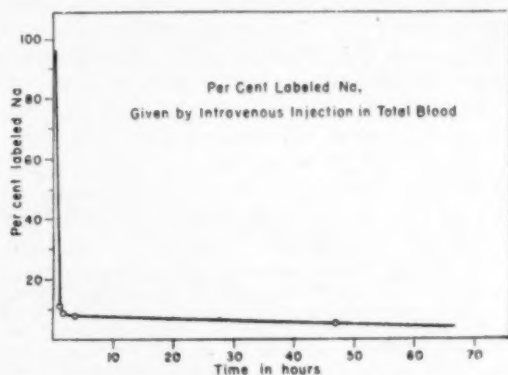


Fig. 4—The disappearance of radio sodium from the blood of the rat shown by the curve.

This discovery led to intense research activities by physicists all over the world. By bombarding nuclei of the elements with neutrons, protons, or *alpha* particles, many radioactive isotopes were formed. The bombardment resulted in either the addition of neutrons to the nuclei, or the breaking up of them which resulted in the remaining part being unstable. At least 1 radioactive isotope can now be made from each of the elements of the periodic table.

PRODUCTION OF RADIOACTIVE ISOTOPES

The most common process of producing radioactive isotopes is simply the addition of 1 or more neutrons to the normally stable nucleus. For example, the addition of a neutron to a sodium nucleus or to a silver nucleus results in an unstable combination.* The new atoms behave chemically as ordinary sodium or silver, but their nuclei disintegrate. The half life of the sodium is about fifteen years, that of silver (at least for some of the isotopes) is much less.

*In the presentation of this paper, silver was made radioactive by neutron bombardment and its activity tested with a Geiger counter.

It was early recognized that radioactive isotopes would serve as a useful research tool. Methods of production in cyclotrons and other atom smashing machines did not

TABLE 1—Biologically Useful Radioisotopes Produced with Chain-Reacting Pile

Isotope	Half life	Beta ray energy (Mev)	Gamma ray energy (Mev)
C 14	4,700 y	0.145	.....
Na 24	14.8 h	1.4	1.4, 2.8
P 32	14.3 d	1.69	.....
S 35	87.1 d	0.17	.....
Cl 36	10 ⁶ y	0.66	.....
K 42	12.4 h	3.5	.....
Ca 45	180 d	0.3	.....
Fe 55	4 y	K	.....
Fe 59	44 d	0.26, 0.46	1.1, 1.3
Co 60	5.3 y	0.3	1.1, 1.3
Zn 65	250 d	0.4 β^+ , K, e-	1.14
Zn 69	13.8 h	I.T., 1.0	0.439
As 76	26.8 h	1.1, 1.7, 2.7	0.57, 1.25
Sr 89	53 d	1.5	.....
Sr 90	25 y	0.6	.....
I 131	8.0 d	0.6	0.367, 0.080
Au 198	2.7 d	0.8	0.12, 0.44
Hg 197	64 h, 25 h	K, e-, K, e-	0.075; 0.13, 0.16
Hg 203, 205	51.5 d	0.3	0.28

This table shows some of the characteristics of some of the isotopes available from the Atomic Energy Commission. The atomic weights of the isotopes are indicated by the numbers after the symbols. Other notation is as follows: y=years, d=days, h=hours, Mev=million electron volts, \approx =approximate value. K indicates the capture of a K electron by the nucleus, I. T. refers to an isomeric transition, e- refers to an internal-conversion electron, and β^+ indicates a positron (positive electron). The above data was condensed from the announcement of the Manhattan District in *Science*, 103, (1946):697-705, and *Review of Scientific Instruments*, 17, (1946):348-349. Up-to-date information on isotopes available from the AEC may be obtained by writing "Isotopes Branch, Research Division, Manhattan District, P. O. Box E, Oak Ridge, Tenn." A much more complete list of known isotopes has been compiled by Seaborg, *Reviews of Modern Physics*, 16, (1944):1.

permit their manufacture in any large quantities. However, with the development of the atomic bomb, methods are now available by which radioactive isotopes may be produced in quantities thousands and millions of times as great as were available previously. In the uranium piles, two processes take place which result in radioactive isotopes. The fission of the heavy uranium atom into two parts of about equal mass usually results in nuclei having too many neutrons to be stable and thus radioactive elements are produced. The piles are sources of intense clouds of neutrons which may enter into the elements that are placed in the pile and thereby they are made radioactive. It is from uranium piles such as those in the plants at Oak Ridge, Tenn., and Hanford, Wash., that the future sup-

plies of radioactive elements may be obtained.

Table 1 lists a number of radioactive isotopes that are now available from the uranium chain-reacting pile at Oak Ridge. The half lives of the elements are given and the energy of the accompanying beta and gamma rays in terms of a million electron volts (Mev). The radioactive isotopes are particularly useful if they emit energetic beta or gamma rays.

THE GEIGER COUNTER

The modern and extremely useful device for detecting such radioactivity is the Geiger counter. It is shown schematically in figure 1. The essential part is a glass tube (often thin walled) with a fine wire along its axis. The tube, about 6 in. long and 1 in. in diameter, is filled with gas at a low pressure. The inner wall is made electrically conductive by a thin metallic coating. A high voltage (1,000 volts) is produced between the wire and the wall. If ionizing rays pass through the tube, ions are formed in the gas, and under the influence of the high voltage, an electrical discharge is initiated. But arrangements are made to quench the current quickly; thus a pulse of current is produced for

TABLE 2—Distribution of Radiophosphate in Organs of Rat

Subcutaneous Injection Four Hours Earlier			
Organ	Weight Gm.	Per cent Radio P	Specific activity
Bones	21.6	18.6	0.020
Muscles	75.2	15.4	0.131
Liver	7.5	14.0	0.475
Dig. tract and contents	16.2	12.7	0.365
Skin	29.7	8.8	0.192
Lungs			
and heart	9.1	5.0	0.317
Blood	9.0	2.0	0.558
Kidney	1.8	1.87	0.370
Spleen	1.2	1.00	0.256
Brain	1.9	0.16	0.032
Site of injection	3.2	20.5	

each ionizing particle. This current may be amplified and made to operate a loud speaker or a mechanical registering device. The number of "clicks" per minute of the loud speaker can be used as a measure of the amount of radioactive material near the counter tube. Thus one may detect the presence and obtain comparative measurements of the amount of radio-

active material in a tissue or in a container without chemical analysis. Because of the large number of atoms disintegrating in a very small mass of radioactive material, the Geiger counter is sufficiently sensitive to detect quantities that would escape any other known method of observation. If one drinks salt water in which there is an amount of radioactive sodium measured in micrograms, the presence of the radioactive sodium can be detected in the hand within fifteen minutes. It is only necessary to place the hand in the immediate neighborhood of the Geiger counter tube. Since the radioactive sodium behaves chemically in the same manner as normal sodium, we may be sure that the sodium taken by mouth has arrived at the hand. We can, in fact, by proper calibration of the instrument tell what fraction of that taken into the body is located in the hand.

RADIOACTIVE TRACER ELEMENTS

A few examples of studies in which radioactive tracer elements were used will now be described. Phosphorus, ^{31}P can be made radioactive by the addition of a neutron. The new atom (^{32}P) has a convenient half life of fourteen and one-half days and emits an energetic *beta* particle which can be readily detected. The radiophosphorus in various parts of a growing plant may be determined by the Geiger counter or by placing a leaf or other part of the plant directly on a photographic plate. The radiations affect the photographic plate, and upon development it will show those regions of the leaf which contain the most phosphorus.

Table 2 shows the quantitative distribution of radiophosphorus in various organs of the rat. The rat was destroyed four hours after the subcutaneous injection of the radioactive material. The last column shows the amount of radiophosphorus relative to the total amount of phosphorus in the organ. During the time of this experiment, the liver had absorbed a relatively large amount of the radio-element, that is, the specific activity for this organ was large. In terms of the total amount injected, the skeleton had absorbed the largest fraction (18.6%). The brain contained very little (0.16%) of the administered dose.

Figure 2 shows how the radiophosphorus contained in the urine decreased over a period of fourteen weeks after a single subcutaneous injection was given to rats.

The result shows that the phosphate taken today will require many weeks before it is excreted entirely.

The uptake by the bones and teeth of radiocalcium and radiophosphorus administered simultaneously to a single rat is shown in figure 3. The animals were killed five days after the injection. It is interesting to note the relative amounts of the materials taken up by the teeth.

Figure 4 shows some results when radioactive sodium chloride is given by intravenous injections and samples of blood withdrawn for a test by the Geiger counter at intervals after the injection. Within two hours, only about 10 per cent of the administered sodium remains in circulation. In other words, within two hours 90 atoms out of each 100 will have left the blood and have been replaced by others from the interstitial fluid spaces. It is significant to point out that tracer studies give proof of existence of a turmoil going on in the body in which molecules of protein, carbohydrates, and fat are constantly being torn down and reassembled.

By means of radiocarbon, it has been shown in figure 3. The animals were atmosphere containing radioactive carbon dioxide, some of the radiocarbon becomes fixed in the liver glycogen and blood sugar. These experiments were performed with the short lived carbon (^{11}C). Now that the newer radioactive carbon (^{14}C) is available in large quantities, organic compounds such as glucose and lactic acid can be made in useful amounts with a tracer isotope. We can thus expect significant advances in our knowledge of metabolism by the use of this tool.

CONCLUSION

I have given no direct applications of tracer isotopes in veterinary medicine, but undoubtedly to many of you some applications occur at once. The large size of most farm animals has necessitated correspondingly large amounts of tracer isotopes, and these before the days of the uranium piles were not easily available. As the radioactive isotopes become available in larger quantities, we may expect widespread use in the medical sciences including veterinary medicine. Their first use will undoubtedly be in research, but later clinical applications will certainly follow.

A final remark should be made regarding the handling of radioactive materials. The

small amounts of isotopes of short life that may be used in many experiments are relatively harmless, but today large amounts of active isotopes, equivalent to many milligrams, or even grams, of radium are available. Strong sources of the radiations must be treated with high respect. Lead containers should be used in transporting them and often lead shields are to be used in protecting the operator when the materials are used. The effectiveness of the inverse square law should not be forgotten. A concentrated sample at 1 in. from the finger is 100 times as potent as one 10 in. away.

The "Wonder Drugs"

Dr. John H. Talbott, School of Medicine, University of Buffalo (*Time*, March 1, 1948), wisely points out that men and even doctors get excited over every out-of-the-usual drug that comes along, enthusiastically introduced as possessing outstanding curative properties. Apparently, the premature enthusiasm is due to the everlasting faith in magic. A headline or two in the newspapers does the trick before critical research has had time to study the dangers which are known to lurk in every potent medicinal ever discovered. For example:

1) The *sulfonamides* cause anoxia, cyanosis, anemia, nausea, hepatitis, nephritis, avitaminosis, and severely disturb normal digestive processes, curative as they were announced to be in acute organic infections when prescribed regardless of their contraindications.

2) *Penicillin*, though generally nontoxic and nonirritant, occasionally causes an acute rash and its use in the neural canal may be fatal; and as tolerance is quickly established from its use, it should be reserved for serious ailments only. The random use of penicillin is objectionable.

3) *Streptomycin* belongs to the dangerous drug class except in the hands of the experienced. It may cause dizziness, ringing of the ears, skin eruptions, and it has been reported to damage the kidneys.

4) *Thiouracil*, lauded as a panacea for thyroid deficiency, may cause fatal damage to the white blood cells, and myxedema.

5) *Nitrogen Mustard*, noted for the response of Hodgkin's disease (human) to its action, inhibits the function of the hematopoietic mechanism and should, therefore, not be used in primary or secondary anemias.

These are but five out of a long list of

new drugs, chemicals, and biologic agents which have come bouncing into the clinical field and thus gained precocious publicity in the lay press to the end that their lay use, or demand for their use, has distorted the truth as to their safety. To these may be added the many barbiturates and vitamin nostrums procurable at every counter and used without professional advice.

Zinc Sulfophenate in Canine Otitis

On the basis of extensive clinical experience, zinc sulfophenate is recommended as an ear canker treatment worthy of trial. N. H. Bastawy, M.V.Sc., of the veterinary faculty at Fouad I University in Cairo, Egypt, used this drug in 0.05 per cent aqueous solution to treat dozens of cases in dogs, many of which were in advanced stages despite previous treatment with various drugs. With few exceptions, recovery was complete following treatment for a few days to several weeks.

The solution, warmed to body temperature and squirted into the ear with a small enema pump, was applied once or twice daily, depending upon the severity of the case. A 100-cc. irrigation was used for moderately severe cases. The ear was dried with cotton wool after treatment, and no other drug was used.

In the author's experience, zinc sulfophenate therapy promoted recovery in less time than other drugs commonly used, relieved pain faster, and had economic benefits in the form of saving time and trouble in treatment.—*Vet. Rec.*, 60, (Jan. 3, 1948): 3-4

Shipping Milk

Dr. E. W. Tucker of the New York State Veterinary Branch Laboratory at Kingston, N. Y., informs me that placing a small rubber balloon, previously filled with water and frozen in the ice compartment of an electric refrigerator, in the package containing a sample of milk or other fluid will provide leakproof and adequate refrigeration for an average postal journey.—*Dr. Jerome Payton, Morris, N. Y.*

Livestock and livestock products represent 54 per cent of the farmer's income, 40 per cent of the nation's food bill, and 14 per cent of the cost of living.—*Hoard's Dairyman*, Dec. 25, 1947.

The Necessity for Research on Foot-and-Mouth Disease

WILLIAM A. HAGAN

Ithaca, New York

THE WORDS "foot-and-mouth disease" have always had an ominous sound to the livestock people of the United States. Undoubtedly, this is due to the drastic and somewhat spectacular methods that have been used in stamping out the half-dozen outbreaks that have occurred in this country during the last fifty years. Foot-and-mouth disease is not the deadly malady of animals that many think it is, because of the publicity it has had in this country, but it does have a very serious effect upon animals though it does not kill a high percentage of those affected. It is a disease that we do not want in our herds and flocks, and we should do everything possible to keep it from crossing our borders.

Australia and the North American continent are the only major land masses in the world that have long succeeded in keeping free of this disease. Our stamping-out methods have been highly successful, and in future outbreaks this method unquestionably will be used again. I have every confidence that isolated outbreaks such as we have had in the past can be successfully handled in this way. It should be kept in mind, however, that it is not beyond the realm of possibility that at some time in the future we may encounter an outbreak of such magnitude that it will be impracticable to destroy all infected and exposed animals. If this should happen, our attitude toward control of the disease would have to take a turn in some other direction. We would be compelled to learn to live with the disease, as the countries of continental Europe and most other parts of the world have had to do for many years.

The danger of infections from this and other highly destructive, highly contagious, exotic diseases is much greater today than it was only a few years ago. I am not now referring to the situation Mexico but to

the great developments in speedy air transportation and its increasing use for transporting not only persons but goods from one place to another. As all of you know, an ever increasing flow of people and goods are arriving daily at our great overseas airports. People from Europe, Africa, Asia, and South America—regions where foot-and-mouth disease has existed so long that they give it little thought—arrive on our shores one or two days after they leave their homes. The virus of foot-and-mouth disease is capable of living much longer than this—on soiled clothing, on bits of manure on the soles of their shoes, on or in articles in their baggage. It takes an almost infinitesimal amount of infected saliva or tissue to start an infection in a single animal. A single infected animal can infect as many others as it may have contact with, directly or indirectly.

During World War II, many of us were very uneasy about the possibility that our enemies might use methods of sabotage to plant foot-and-mouth disease, or other diseases even more destructive, in so many places simultaneously, that stamping out would be an impossibility. We hope that such conditions do not return soon, but the daily news bulletins are not reassuring on this point. If another war does occur, I trust that we will be better prepared than we were during the last one to protect our livestock against this possibility.

The virus which causes foot-and-mouth disease grows only in the tissues of certain animals, principally those which have cloven hoofs (cattle, deer, sheep, goats, swine). The disease is propagated by the passage of the infected secretions from one susceptible animal to the next, either by direct contact, or indirectly through any kind of inanimate object which may have been soiled with infected secretions. Outside of infected animals, the virus generally is short-lived, but if it is protected from sunshine and deleterious chemical actions it sometimes lives for periods measured in weeks and months rather than in hours and days. The chemical actions which occur in the meat of slaughtered animals generally

Presented before the Texas and Southwestern Cattle Raisers' Association, El Paso, Texas, March 18, 1948.

Dr. Hagan, dean of the New York State Veterinary College, Cornell University, is a member of the Foot-and-Mouth Disease Research Advisory Committee appointed by Dr. B. T. Simms, chief, Bureau of Animal Industry.

destroy the virus within a few days, but active virus has been found on the surfaces of such carcasses, in the blood, and in the marrow of their bones after several months of refrigeration. Because of the occasional persistence of the virus in this way, the disease often is carried to stock in distant lands. During World War II, England experienced many isolated outbreaks of foot-and-mouth disease, most of them beginning in swine which had been fed on uncooked garbage. Since England during that period was getting much of its meat from South American countries where the disease existed, it can hardly be doubted that uncooked bones and scraps from such meat were the cause of the outbreaks. We have had two experiences of that sort ourselves in the California outbreaks of twenty years ago, which were traced to swine fed on ships' garbage. Since that time we have not allowed ships, coming from ports where foot-and-mouth exists, to land garbage.

IMPORTATION OF ANIMALS CONTROLLED

Our government through the agency of the Bureau of Animal Industry of the Department of Agriculture, exercises rigid control over importation of animals of species that are susceptible to foot-and-mouth disease. The Smoot-Hawley tariff bill gives authority to the Secretary of Agriculture to maintain an embargo on animals and animal products which originate in countries where the disease is known to occur. This authority has been used for many years to protect our livestock industry. It is applied to all such countries, of course, but it is most distasteful to certain South American countries which have large meat-producing interests. This has been called a "phoney" law by some who argue that economic considerations, rather than protection from disease, are behind it. This view is based on ignorance, or prejudice, or both. England's wartime experience should be enough to convince any fair-minded person of the danger of importing such materials into a country where the disease does not already exist.

None of the outbreaks that we have had in the last half-century have been traced to the importation of live, infected animals. As I have already said, two of these outbreaks were traced to ships' garbage. Another was definitely traced to contaminated

smallpox vaccine which had been imported from Japan, and a still earlier outbreak very likely originated in the same way. Although the other outbreaks were not definitely traced to their origins, it is quite clear that livestock were not primarily involved but inanimate materials contaminated with virus.

THE MEXICAN OUTBREAK

The appearance of foot-and-mouth disease in Mexico in 1946 and its persistence there over a rather wide territory for a year and a half have created a hazard more critical than any that we have had to face previously. The disease was already well established before it was recognized. Other difficulties which I do not need to detail here have prevented elimination of the disease by our traditional stamping-out method. The difficulties and chances of failure were well appreciated by those in charge from the very beginning. The job, when the joint commission began work last year, obviously was to hold the disease to the area already involved if possible, and then to undertake to destroy the infection within by slaughter methods. Even though it looked unpromising from the beginning, it was judged that there was some chance of success, and the stakes were so high that it was thought worth trying. I feel that they were correct in this. If it had not been tried, the livestock people in this country would forever have felt that a mistake had been made in not making the attempt.

The money that we have spent in Mexico has not been wasted by any means. For one thing, the disease has been held within the general area it occupied when the campaign against it was begun. Certainly this has been worth while. Another accomplishment is that we still have a working arrangement with our southern neighbor to try to hold a line far south of our own border. This has great advantages to Mexico, of course, but it should be realized that such a line is far shorter than our own border. We must exhaust every resource to find a way eventually to stamp out the disease in Mexico. We cannot continue indefinitely to hold a line in a foreign country. We must actively work in the infected area looking toward eliminating the disease. The alternative 's to withdraw to our own border and to hold the line there

as effectively and as long as we can, and that looks like a permanent matter, unless we are to give up the fight and accept the situation of living with the disease. I do not think any of us will agree to that solution yet.

ADVISORY COMMITTEE APPOINTED

The chief of the Bureau of Animal Industry, Dr. B. T. Simms, last summer appointed a scientific advisory committee of experienced men outside of government service to advise him on a research program which had been authorized by Congress. At its first meeting, early in September, this committee recommended what it termed a short-time and a long-time program. For the short-time program it recommended that immediate steps be taken to evaluate certain European vaccines, which will be mentioned later, in Mexico. It was proposed that efforts be made to learn whether it would be possible to have some of the established laboratories of certain European countries make up lots of vaccine using virus which had been collected in Mexico. It was also advised that several Americans be sent to the European laboratories to learn details of the technique of making such vaccines in case it was found desirable later to begin their manufacture on this continent. Dr. H. W. Schoening, who is in charge of the Pathological Division of the Bureau, was sent to Europe to visit these laboratories and to make preliminary arrangements. Recently, three staff members were sent abroad to work in these laboratories and several lots of vaccine are being made up from Mexican virus there to be tested in Mexico as soon as they are ready. In the meantime, some of the European type vaccines have been imported into Mexico and are now being tested there. A vaccine from Argentina is also being subjected to critical tests in the laboratory and in the field.

TYPES OF VACCINES

At the present time, two types of vaccines are being made in Europe. One, known as the Waldmann, or Schmidt-Waldmann, vaccine has been widely and successfully used on the continent. This vaccine is made from cattle and is relatively expensive. It contains virus which has been destroyed chemically, hence it is not dangerous. The immunity produced by it

lasts from six to twelve months. It is used in Europe to immunize susceptible stock in areas around centers of infection in order to prevent the disease from spreading. The experience with it has been so good that four countries now have laboratories in which it is made (Denmark, Holland, Switzerland, and Italy). A plant has been built in the American zone of Germany for its manufacture and it should soon be in operation.

For some years, the British have been working with a vaccine of a somewhat different type. From laboratory tests it seems likely that this vaccine will also be successful but it has not been extensively tested in the field as yet. Recently, a vaccine has been announced by some Argentine workers who have tested it rather extensively in the field with success. This appears to be a modification of the Schmidt-Waldmann type. It is more concentrated, and much smaller doses are needed since it is administered intradermally rather than subcutaneously. The much smaller doses greatly cheapen it, and it is also claimed that it produces immunity in seven days whereas the Waldmann type takes about twice as long to get effective immunity. If this is true, it is a considerable advantage.

It is known that foot-and-mouth disease is produced by several different types of virus. The diseases produced by the several types cannot be distinguished from one another but animals which suffer from one type, or are immunized by vaccines made from this type, will not be immunized against the other types of virus. This means that before vaccines can be used intelligently or effectively one must know what type of virus occurs in the vicinity. The European viruses are designated by the letters O, A, and C. Comparison of Mexican virus strains indicate that they are closely related but not identical to the European type A. Whether the European vaccines will be effective against the Mexican virus can be determined only by trials which are being run now. There is every reason to believe that vaccine made from the Mexican strain itself will be effective, but this also will be tested before it is employed on a wide scale.

RESEARCH LABORATORY RECOMMENDED

The long-term program, recommended by the advisory committee, was that a well-

equipped laboratory should be built on American soil to undertake extensive studies on the virus of foot-and-mouth disease, employing new methods of virus research developed in recent years. A bill is now before Congress which will authorize the Secretary of Agriculture to set up a modern research laboratory such as was envisaged by the committee. It is to be hoped that the measure will be approved by the Congress and that steps will be taken immediately to bring this institution into being. It is planned to place the laboratory within the borders of the United States. This decision was reached after consulting not only the advisory committee but also virus disease experts in this country and abroad. Many people believe that such an institution on the mainland of the United States would constitute a hazard because of the danger of the escape of virus from it. It is the consensus of those consulted, however, that if the unit is properly constructed and operated the hazard will be slight. Plans for this laboratory are now being made. It will be set in an area of at least 600 acres, surrounded by a high, chain link fence. Inside will be a compound about 40 acres in area, surrounded by a concrete wall sunk in the ground to be rodent proof, and rising at least 6 ft. above ground, and surmounted by a chain link fence. The compound will have only two openings, both through buildings. One of these will be for the unloading of materials and supplies, including experimental animals; the other for the admission of the personnel. The persons whose duties carry them into the buildings where infection exists will be able to get there only by passing through the administration building and through changing rooms where all street clothing will be doffed, a shower bath taken, and special clothing donned on the other side of the shower for their work. In coming out of the unit, the process will be reversed.

The plant will involve the construction of a series of buildings to serve as laboratories, stable units for uninfected animals, similar units for infected animals, an incinerating plant, and a power plant. All infected animals and materials will be confined to buildings that are interconnected with galleries so that infected animals, infected materials, and personnel while they are working with virus, will never be out-of-doors. These buildings will be con-

structed with no outside openings and will be ventilated by fans that exhaust all building air through a furnace where it will be sterilized before being discharged. All sewage will drain into tanks which will be connected with steam lines so it will be sterilized before it is discharged. Bedding, carcasses, and other waste materials will be incinerated.

The suggestion was entertained of having the unit on a small island as an additional precaution. This was abandoned, however, at the suggestion of many who had visited the European laboratories. Several of these originally were located on islands but operational difficulties have caused all of them to abandon the island principle. It has proved to be difficult to enlist and retain good staff people under such conditions. Married people are not content to remain for long periods away from their families, and if the families are taken to live on the island, school, medical, and recreational facilities have to be provided, and a host of social problems arise. Furthermore, the dangers of the escape of virus from a well-designed unit seem to have been greatly exaggerated. For twenty-five years the English have maintained a rather large station at Pirbright, near London, in the center of a dairy district and, although much work has been done on cattle, and the facilities are not nearly as elaborate as are planned here, they have never had an outbreak traced to it. The Swiss have their laboratory at Berne, the Dutch have theirs at Amsterdam, and the Italians at Brescia, a small town near Milan—all inland locations. None have reported any difficulty in preventing escape of virus.

For several reasons, it is believed that a location on the seacoast would be desirable. A peninsula where the population of susceptible stock is rather sparse is regarded as ideal, especially if it is near enough to centers where the staff could meet with their colleagues from time to time and where good library facilities would be located.

Because of the great fear of the disease in this country, it was expected that the initial reaction to the proposal to work with the disease on the mainland would be one of opposition. As I have tried to show, however, the evidence is clear that such work can be done with little chance of the infection escaping. Our need for answers

to many questions relative to the control of this disease is so great that I do not think we can afford not to have such a laboratory.

As to location, surveys of a number of possible sites have been made. No decision has yet been reached but the one that is regarded as offering the greatest advantages is the tip of Long Island, in New York State. This Island is about 150 miles long. The landward end is occupied by Brooklyn and a series of heavily populated suburban towns, which is regarded as something of a barrier in the eventuality that the disease should ever appear on the island. Half-way out on the Island, and beyond, are market gardens and poultry and duck ranches. There are only a few herds on the Island and these are mostly in the western half. The last few miles toward the tip are sparsely inhabited. The Long Island Railway runs almost to the end of the Island and provides means by which staff members could readily reach New York City. There is a good automobile highway at the tip of the Island and many good roads nearer the city. Near the end are several small towns in which it would be expected the staff would be required to live. The railroad would make it easy to handle the necessary mail and freight.

The federal government probably has the authority to acquire land and set up such a unit without obtaining permission of the state authorities, but the Department of Agriculture prefers to have the approval of the state concerned. This may prove a stumbling block, for while it is usually easy to convince livestock men of the desirability of having such a laboratory, most of them seem to prefer to have it built as far away from them as possible.

TENTATIVE PROGRAM OF RESEARCH LABORATORY

The program which the laboratory would undertake has been tentatively outlined to include the following:

- 1) To conduct fundamental research on the virus itself including its physical, chemical, and biologic properties and its relation to other viruses.
- 2) To study different strains of the virus and their relations to one another.
- 3) To carry on studies on modes of transmission, including carrier animals, wildlife, etc.
- 4) To develop better diagnostic methods.

5) To develop more effective and less expensive vaccines.

6) To develop more efficient methods of disinfecting contaminated premises and areas.

This laboratory when developed will enable our scientists to work on this disease, and should we ever have the need of producing large amounts of vaccines, the facilities would be at hand for doing it. Although the laboratory is projected principally for the study of foot-and-mouth disease, the facilities would be suitable for doing work with other dangerous agents that sometime may be of greater interest and concern to us. The laboratory will be a costly enterprise to build and operate, but the importance of protecting our livestock industry to the best of our ability is such that the project merits the support of all who have an interest in this great industry.

Unconquered Foes.—President W. A. Craft of the American Society of Animal Production, at its thirty-ninth annual meeting in Chicago last December, told his audience of prominent stockmen, teachers, researchers, geneticists, veterinarians, feed chemists, and others of the animal-production field, among other matters of importance, that "Methods of processing protein supplements and feeding practices have improved, and knowledge of vitamins and minerals has advanced" and although men of the veterinary profession have achieved much, "there are still unconquered foes to confront which challenge all groups in the animal sciences."

Anatuberculin.—A method of vaccinating infants against tuberculosis by means of a tuberculosis toxoid has been developed in Italy and is known as Petragani's anatuberculin. It is composed of a formalin-killed culture of *Mycobacterium tuberculosis*. The vaccine has been employed for about eight years by the Vaccine Center of Bologna on a total of 5,700 infants. The method consists of producing four lesions on the skin with the vaccine. The lesions take on the histologic character of tuberculous tissue, leave scars, and produce a persistent allergy to the intradermal tuberculin test. The results reported under equal conditions of exposure were better than from BCG.—*From Italian correspondence in the J. Am. M. A., March 6, 1948.*

Foot-and-Mouth Disease Situation

Progress Reported in New Foot-and-Mouth Disease Campaign

Information received from the USDA during March, 1948, showed that the recently revised program for controlling foot-and-mouth disease has scored gains in several phases.

The new program is designed essentially to hem in the infection so that it cannot spread to new areas. Members of the Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease are hopeful, however, that the use of quarantine, fencing, slaughter in the buffer zones, and vaccination will not only hold the disease in check but also will serve to press it into small pockets that can be primed, eventually, for a successful, owner-approved program of eradication by the complete slaughter method.

Though apparently viewing the present set-up with cautious optimism, neither the Commission as a whole nor officials of the USDA are making any rosy predictions about the ultimate result. The attitude, as measured by the tone of current USDA news releases, is one of watchful waiting—and of conservative reporting.

The most encouraging developments during March, in the opinion of USDA officials, were the pushing back, as much as 50 miles in some places, of a 100-mile segment of the northern quarantine line in the State of San Luis Potosi and the elimination of infection in several areas nearest the quarantine line in the State of Veracruz. "These developments have increased the security of the line in those parts of Mexico," Dr. B. T. Simms, chief of the U. S. BAI, said, and he emphasized that during the entire campaign no case of the disease has appeared north of the present quarantine line.

Meanwhile, engineering crews went to work with bulldozers to start construction of a 90-mile section of barbed-wire fence in the eastern part of the northern quarantine line. By the middle of March, they had cleared a fence path of about 30 miles through jungles and swamps. When completed, the fence will extend from a point below the town of Tamiagua on the Gulf coast in the State of Veracruz to Tamazunchale, in Veracruz. There will be gates

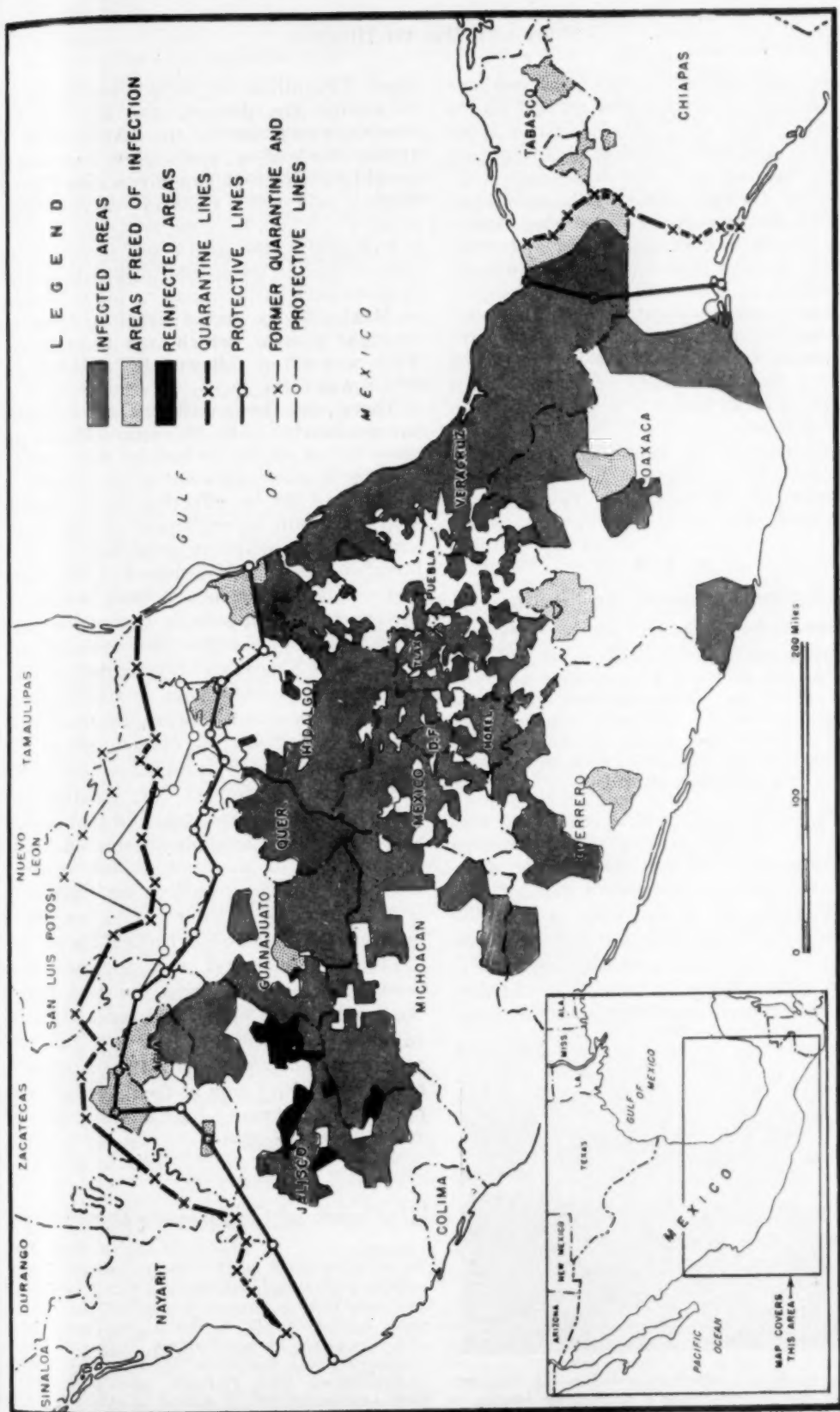
at natural points of travel, and traffic regulations will be enforced by sanitary technicians and the Mexican army. The Commission regards the fence as an experiment which, it is hoped, "will provide answers to questions relating to the practicability of fencing in Mexico."

Dr. M. E. Clarkson, chief of the Inspection and Quarantine Division of the U. S. BAI, in a special communication to the AVMA office, said that up to March 8, somewhat over 10,000 cattle were vaccinated in northern Veracruz, around the areas where the disease was recently stamped out. In addition, over 12,000 cattle were vaccinated in the western part of the buffer zone just beyond the closest approach of the disease in the State of Jalisco. Most of the vaccine was purchased from Argentina. "Preliminary tests indicate that the vaccine will give some protection and aid us in holding the line against further spread of the disease," Dr. Clarkson said, "but it is too early to draw any real conclusions from field observations."

The cooperation of livestock owners in the vaccination project is called fairly satisfactory, though USDA spokesmen said some resistance has been met. The resistance seems to be traceable to a fear that the vaccines will infect animals, notwithstanding that an educational program has been conducted to dispel this belief.

Slaughter is being done on a small scale in the southern buffer zone, to prevent extension of the infected areas. During February, about 4,300 animals, mostly cattle, were destroyed.

Mexican viruses—most of which have been identified by the British laboratory at Pirbright, England, as being variants of type A virus—will shortly be used to produce vaccines for the Mexican campaign. The Pirbright laboratory will supply the viruses to various government laboratories in Europe which have arranged to fill orders placed by the Commission. Drs. L. O. Mott, H. W. Johnson, and E. A. Eichhorn, of the U. S. BAI, are now touring these laboratories (in England, Denmark, The Netherlands, and Switzerland). The stated purpose of their visit is "to obtain for the United States first-hand information on foot-and-mouth



The Foot-and-Mouth Disease Situation in Mexico, March 5, 1948
Based on Reports Received by the U. S. Department of Agriculture

—Map prepared by U. S. Forest Service

disease research in Europe and methods used for the prevention and control of the disease." They are studying virus types and virus properties, methods of preparing and testing vaccines, and diagnosis.

Another forward move in the new campaign is the expansion of canning operations to provide an outlet for cattle in northern Mexico that would normally move on-the-hoof to United States markets. Six plants are now in operation and others are scheduled to open soon. Contracts have been placed with these plants by the USDA for 72½ million pounds of canned meat and gravy, all of which will go into foreign relief channels.

"Adjustments in campaign personnel" were cited by the USDA, without comment, as another of the significant developments in the program.

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Observations on Foot-and-Mouth Disease in Mexico

This is an abstract of a paper by Dr. Jean C. Flint, Salt Lake City, Utah, which was presented before the Intermountain Veterinary Medical Association, Salt Lake City, on Jan. 12-14, 1948, and before the Annual Short Course for Veterinarians, Colorado A. & M. College, Fort Collins, on Feb. 16-18, 1948.

As a veterinarian and a temporary employee of the BAI, I was sent to Mexico on July 1, 1947, to take part in the campaign against foot-and-mouth disease.

The disease has spread over an area 600 mi. from north to south and 700 mi. from east to west in just one year's time, and it is now within 250 mi. of the Texas border. During that year, the U. S. Government has



Note spectators (potential spreaders of disease) around the pit in the state of Michoacan, Mexico.

spent \$35 million in Mexico vainly trying to combat the disease, and has had 500 American employees of the BAI down there, trying to hold a quarantine line which, roughly, runs from Tampico on the Gulf of Mexico to Puerto Vallarta on the Pacific coast.

Frequently, the death loss is only 3 per cent or less in the initial outbreak, but the animals only partly recover. Many of those in Mexico had a second attack in from two to eight months, which was more severe. This was often followed by a third one, which was fatal.

There was no possibility of enforcing the quarantine with Mexican soldiers, and there is no reason to believe that quarantine in Mexico will ever be successful. A quarantine, to be effective, must literally stop practically all movement of man, beast, and vehicles, including produce, out of an infected area. This means twenty-four hours a day, seven days a week, which is a far cry from past patrols along some parts of the Mexican border which operated only eight hours a day and only six days a week.

There is probably not a single veterinarian or research worker in the USDA who really believes the disease can be controlled by the present vaccines, for it has been repeatedly proved that vaccines give only short-time protection, and then only to a portion of the animals vaccinated. Thus, the program in Mexico is ended, to all intents and purposes, and, in my opinion, it is only a matter of time before we will be fighting the disease on United States soil.

Probably the first and foremost step deemed necessary by most livestock men is the building of a high, tight fence along the International border. Needless to say, such a fence would require patrol roads along it, and a man with a gun at frequent intervals, on a basis of twenty-four hours a day and seven days a week.

Highlights of Congressional Hearings

Continuing the report begun in the April JOURNAL (p. 291) on the foot-and-mouth disease situation in Mexico, we have selected additional statements from published proceedings of hearings, Dec. 3-5, 1947, before a subcommittee of the Committee on Agriculture, House of Representatives, 80th Congress. Dr. George W. Gillie, Congressman from Indiana, was chairman of this subcommittee; a digest of his report on

these hearings appeared in the March, 1948, JOURNAL (pp. 196-197).

From Statements of Mr. Robert Kleberg, Kingsville, Texas.—Some countries may be able to live with foot-and-mouth disease, but the United States could not because of its methods of producing and marketing animals—involving movement over long distances from range to feedlot to slaughterhouse. It is perfectly clear that unless we get a sound program, this disease is going to spread into northern Mexico and into our country. I doubt that we would have enough food on our tables if it were to become established here.

From Statements of Gen. Charles H. Corlett (U. S. Army, Retired), Special Representative of the Secretary of Agriculture.—I am convinced that the USDA and State Department have done everything they thought possible to do to whip this disease. I know the feeling of the men from having worked with them, and I do not think they intentionally held back any information from anyone. This whole affair had to be handled with skilled diplomacy because opponents of the Mexican administration were using the slaughter program as political ammunition. I feel that we would have foot-and-mouth disease in the United States now if we had not participated in the campaign in Mexico.

What high Mexican government officials said they would do and what the governors of certain Mexican states finally consented to do, and instructed their people to do, were entirely different things. In many of the "hot spots," the people are prejudiced against anything American. Cattlemen in northern Mexico, however, are anxious to get rid of the disease and are highly coöperative.

The plan that the BAI used would have been all right for the United States, but it was not workable in Mexico.

This mule deal—the long delays and failures in bringing in mules to replace slaughtered oxen—was not the fault of the United States. Moreover, many Mexicans were uninformed as to the handling, care, and feeding of mules.

It seems apparent that we must bow temporarily to the Mexican demand for vaccination, but, on the other hand, we must try to get them to resume slaughter operations as soon as possible—in the north, at least. If we try to force the issue, however, they may tell us to pack up and get out, and we cannot afford to do that. If we are ever going to eradicate this disease, we must stay there.

It is not advisable for a military man to head this program. The State Department objects to having a military man in charge, the Mexican government resents having United States military personnel involved, and there is bound to be resentment even among our own eradication forces. This job belongs to the Bureau

of Animal Industry. If the Bureau does not have a qualified man in its own ranks, it should bring into its organization an outside man who does have the proper qualifications. Some Bureau men may not be trained in organization—but they are wonderful technicians. If necessary, let the Bureau take in an organizer or a diplomat—someone who speaks Spanish fluently and can wield influence at the conferences held.

From Statements by Mr. Charles E. Wiswall, Cattle Dealer, Sonora, Mexico.—Prior to the foot-and-mouth disease embargo, Mexico exported about 500,000 head of cattle a year to the United States, 75 per cent of which were calves and yearlings. The expansion of canning operations—to utilize the cattle that formerly went into export trade—will help to relieve the economic impact of the embargo, but it falls far short of replacing, financially, the former trade in live cattle. The reason is that cattle sell for about twice as much at United States markets as in Mexico. Cattle sold for local consumption in Mexico bring about 11 cents per liveweight pound, but canneries pay only 6 to 6½ cents per pound. The canned meat is sold to the Commodity Credit Corporation and used in European relief.

From Statements of Mr. A. K. Mitchell, Chairman, Advisory Committee on Foot-and-Mouth Disease.—The threat to our own economy makes it imperative that we carry on below the border. It will be much easier to hold a quarantine line along a 700-mile northern stretch of infected territory in Mexico than to fight off the disease along 2,000 miles of our own border. The average Mexican with whom our eradication forces have been dealing understands neither the meaning of disease nor the importance of enforcing sanitary regulations. The disease could be eradicated through a slaughter-burial program, though it might take a long time. Expenditure of \$36 million by the United States was justified because the disease would be in this country now had we not gone down to fight it. We cannot depend wholly on a quarantine line to hold the disease in check, since a political upheaval in Mexico would upset all quarantine operations and obliterate the line. For this reason, we should view the northern quarantine as a temporary expedient while working to get a program in operation that will drive south against the infection.

From personal observations, I can say that I never saw a group work with greater interest and determination than our United States personnel. They did so even when the situation looked almost hopeless, and even at the time the Mexican government was urging a change in the program, for they did not want to break down the morale of the Mexican people and thereby destroy any last hope for victory. In view of this, the encouraging press

information given out about the progress of the work was justified. Any display of defeatism in this information would have been immediately ruinous to the whole program. I do not feel that any information has been withheld from Congress or from any other group that should have had it.

From Statements of Mr. C. E. Weymouth, Representing Texas Livestock Producers' Organizations.—The eradication of foot-and-mouth disease necessitates the attention of Congress, the interest and attention of the President of the United States, and the interest and attention of our agriculture and state departments. I am fearful that the USDA has not had enough coöperation from these other sources to carry on an adequate program. We have received great benefit from the expenditure of funds thus far in Mexico.

With regard to future operations, I think there should be a reorganization of our forces and elimination of incompetent personnel regardless of rank and service, with a strong administrative leader reporting directly to the Secretary of Agriculture—and unless this is done, the program cannot succeed.

From Statements of Mr. Ben F. Williams, Douglas, Ariz., Owner of Cattle in United States and Mexico.—Go to any of the Indians, any of the men in the cattle business in the south, the farmers who have oxen—and they will tell you that this disease we are seeking to eradicate is *fiebre de la yerba*, literally, "fever of the weed" or poison. They resented having their animals killed, because this "fever" has been down there always, according to them, dating back certainly to 1921 and possibly to 1911. Therefore, the slaughter program seemed fantastic to them.

Quarantines are impractical and impossible in Mexico for one reason: More than one-tenth of the entire population of Mexico is in the quarantine area and it is difficult to control their movements. They travel mountain trails and haul livestock with them. The Mexican army will not interfere with these people, practically all of whom are poor. If one of them wants to bring a pig across the quarantine line, the soldiers will not stop him. Moreover, these people hid hundreds of animals on the roofs of their houses so that the slaughter forces would not find them.

In my opinion, the \$36 million spent by our government on the eradication program was substantially, but not completely, wasted. The slaughter program could never have been completed successfully, nor will it ever be completed successfully. I think we can establish a partial premise for a belief that foot-and-mouth disease has existed in Mexico for many years—and that if birds and air traffic have not brought the virus into the United States over this period of years, we do not have a

great deal to fear from it now. It appears that the disease in Mexico has been a reinfection. Regardless of what is done about fighting it below the border, I do not believe it will break out here. I certainly know that the quarantine is not holding it back.

From Statements of Mr. F. E. Mollin, Executive Secretary, American National Livestock Association, Denver, Colo.—I am sure that the cattle industry of this country will not accept the program Mr. Williams suggests, because we are not ready or willing to give up the fight. Notwithstanding the financial stake Mr. Williams and others in his position have in this affair, it would be better if they exerted pressure on the Mexican government to get this job done instead of exerting it on the United States to surrender and submit to this terrible disease. I urge that consideration be given to the building of a border fence. While there would be greater necessity for such a fence if the disease were to spread to northern Mexico, we should not postpone action because it would take a long time to build it.

From Statements of Mr. T. R. Armstrong, Cattle Owner, Armstrong, Texas.—It is going to take top-level action—President Truman and Secretary of State Marshall—to persuade Mexico to go back to the slaughter program. If such an agreement is reached, we probably will have to pay all expenses except the cost of military maintenance of the quarantine, because Mexico does not have funds to support the program. If we could clean up, by the complete slaughter method, a given strip of infected territory, restock it rapidly, and give wide publicity to the victory, we would be able to win the support of the Mexican people. Use of cattle from northern Mexico to restock the slaughter areas would be a better measure than canning to relieve the effects of the live cattle embargo. Whoever is selected to head the new program must have real authority and should report directly to the President of the United States—not to the BAI or to the Secretary of Agriculture. A fence on the border is necessary, but a fence within Mexico might not be financially justified. It will be enough trouble to get appropriations for one fence, let alone two.

From Statements of Mr. Paul J. Reveley, Division of Mexican Affairs, U. S. Department of State.—From the political angle, I do not think it is possible to renew an all-out slaughter program in Mexico in the near future. We must strengthen the quarantine line and work it out with a combination of vaccination and slaughter—but with slaughter entirely north of the line. I am sure that the Mexican government will agree to that plan. They also will agree to the continued coöperation of the United States in controlling and eradicating the disease, but

under no circumstances will they permit troops of our Army to take part in the program. The original plan for eradication was satisfactory and was carried out to the best of the ability of our veterinary service. I do not see how it could have been improved. It was a new type of campaign in a new country. It was a plan that we hoped would succeed—but it did not.

From Statements of Dr. C. U. Duckworth, California Department of Agriculture, Sacramento, Calif.—Sufficient recognition was not given to the facts that the people, the economy, the politics, and the sociologic aspects were not the same in Mexico as in the United States—so radically different, in fact, that disease-control measures that had proved workable in this country could not be applied in Mexico. It was not the disease which whipped our technicians; it was factors about which they did not have appreciation. They could not have had it; they were not trained along that line. This whole program has been in the process of blowing up ever since it was started. In many cases, farmers connived to let the slaughter forces kill only the animals they wanted to dispose of; those they wanted to keep were hidden in the hills.

We are going to have to proceed slowly in future operations and do a thorough job of educating the Mexican people as to the nature of, and need for, the program. We can profitably use vaccination to hold our ground while we are building up popular support for the slaughter method.

Foot-and-Mouth Disease in Wildlife

Although it has long been known that numerous cloven-hoofed genera of game suffer from foot-and-mouth disease and that its potentiality therefrom is responsible for some of the outbreaks that spring eternally among livestock, little or nothing can be done to abolish that factor once the infection has been widely implanted in a country. So, in weighing vaccination against slaughter and burial, the not-too-well informed planner ought to realize that wheresoever foot-and-mouth disease virus gets a foothold, wildlife forever removes all hope of extermination. The people of the U. S. A. were saved from the distress of forever living with foot-and-mouth disease by the killing of more than 22,000 deer under John R. Mohler's direction during the California outbreak of 1924, for, among them, 2,214 showed active or healed lesions of the disease. In 1944, Rossiter and

Albertyn¹ were able to attribute outbreaks among farm animals to the presence of the disease among wild animals in South Africa. They found lesions of foot-and-mouth disease in impalas (*Aepyceros melampus*), sable antelopes (*Egoceros niger*), waterbucks (*Kobus ellipsoprymnus*), and kudus (*Strepsiceros strepsiceros*). In 1937, the veterinary service of South Rhodesia found fresh foot-and-mouth disease lesions in a kudu from which the infection was reproduced in cattle, and older lesions in an impala. Moreover, among game shot at random, 9 per cent showed evidence of having had the disease. These and other facts, coupled with the California experience, show that foot-and-mouth disease in the wild animals of a country is permanent and, therefore, a continuous menace to its livestock. The only remedy is to keep it out.

¹Rossiter, L. W., and Albertyn A. A. L.: Foot-and-Mouth Disease in Game. J. South African Vet. Med. A., 18, (March, 1947):16-19.

When F-and-M Strikes.—"When foot-and-mouth disease strikes us we won't be feeding Europe. We'll be lucky to be able to feed ourselves."—Robert J. Kleberg, Jr., President of the King Ranch, Texas.

Some Facts about the Tuberculosis Mortality

The tuberculosis death rate in the U. S. A. in 1945 (*Pub. Health Rep.*, Apr., 1947) was 40.1 per 100,000, a decrease from the 41.3 rate for 1944. These are low rates compared with Japan's 101.5, India's 211.9, and China's 267.1. Broken down, the U. S. A. rate (40.1) shows 32.7 for the white population and 98 for Negroes. Among the states, the rate was 10.1 for Wyoming and the highest 123.1 for Arizona, the retreat of many tuberculous immigrants who die away from home. In general, the pulmonary form accounts for 92.4 per cent of these deaths.

Gleaning about for comparative figures, one finds the rate per 100,000 the same year was 1,161 for Shanghai, 1,090 for Tacna (Peru), 362 for Lima (Peru), and 82 for Buenos Aires.

Hogs affected with swine erysipelas may show unexpected vitality when aroused.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Sterilization—Aseptic Technique in Veterinary Practice

MARK W. ALLAM, V.M.D.

Media, Pennsylvania

IN SPITE of the numerous papers that have been presented in the past few years on the subject of sterilization and aseptic technique in veterinary practice, I contend that we are too far behind our physician-surgeon colleagues in the over-all program. Therefore, I believe that this subject merits recapitulation. As has been stated by Arlein and Walter,¹ "If successful surgery is practical, then so is the utilization of aseptic technique according to the most exacting and scientific standards." The veterinary practitioner should no longer be satisfied with the minimum but should strive to follow the most modern procedures.

Sterilization with supersaturated steam in a modern autoclave is the most efficient way to sterilize all except cutting edge instruments. The types and sizes of autoclaves manufactured today are such that it is possible for many practitioners to own one. However, if the amount of surgery a practitioner does is not sufficient to warrant such an investment he can still adopt the aseptic procedures by the purchase of an ordinary pressure cooker (fig. 1). Sterilization in either the autoclave or pressure cooker should be carried out with the standard recommendations as to time, pressure, and temperature. For instance, textile material, such as shroud cloths, laparotomy sheets, gowns, and sponges, should be sterilized at 250 F., 15 lb. pressure, for thirty minutes; whereas instruments should be sterilized at 250 F., 15 lb. pressure, for twenty minutes; and rubber or glassware

at 250 F., 15 lb. pressure, for fifteen minutes. With the pressure cooker, however, it is not possible to dry the sterilized material due to the absence of a jacket, as is found in the autoclave. In the pressure cooker, therefore, it is not practical to sterilize rubber gloves, and in packaging textile material it will be advantageous to wrap the gowns, etc., in heavy brown wrapping paper. The paper allows for a more rapid drying when removed from the pressure cooker after sterilization than does the same material wrapped in sheeting. Some additional drying effect can be derived from pressure cooker sterilization by removing the sterilized contents, pouring off the water, and putting them back in the sterilizer with the lid ajar.

It is difficult to find a method of sterilization better than boiling water. Thus the water sterilizer, whether it be of the large instrument type (fig. 2) or a small porcelain syringe type of sterilizer (fig. 3), is to be recommended. I would like to impress upon every practitioner the thought that we should not begin to time sterilization until the water is actually boiling, nor should we place the instruments in the water until it has started to boil. The first fault would improperly sterilize the instruments and they would rust if placed in the cold water. Instruments should boil for twenty minutes before they are considered ready for use.

The small porcelain sterilizer will prove to be a fine addition to any practitioner's office for sterilizing syringes, as it will boil water in thirty seconds. A clientele appreciates a practitioner who takes time to properly sterilize a syringe before using it. Chemical sterilization of syringes is possible but in many instances one prefers not to contaminate with antiseptic the solution to be injected.

Presented at the Forty-seventh Annual Conference of Veterinarians, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 8, 1947.

Assistant professor of veterinary surgery, School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

¹Arlein, Myron S., and Walter, Carl W.: Aseptic Technique in Veterinary Surgery. *J.A.V.M.A.*, 102, (Jan., 1943):41-47.

It is difficult to discuss chemical sterilization as there are so many good antiseptics and disinfectants available today. In selecting an antiseptic, take time to weigh the value of the one of choice to ascertain



Fig. 1—An ordinary pressure cooker.

whether it will have the proper over-all action desired. For instrument sterilization the use of alcohol, 70 per cent by weight, with 0.5 per cent sodium nitrite added (this to prevent corrosion of the instruments); or one of the chlorine antiseptics, such as aqueous zephiran or phemerol in a 1:1,000 solution with 0.5 per cent sodium nitrite; or formaldehyde solution, such as the Bard-Parker germicide, are recommended.

The Bard-Parker sterilizing tray (fig. 4) can be sealed when the lid is closed, thus preventing outside contamination. It is

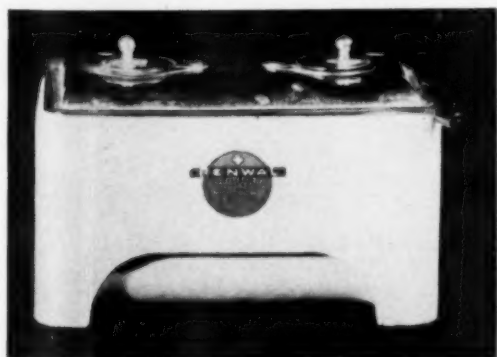


Fig. 3—A small porcelain, syringe-type sterilizer.

an excellent tray for holding cutting edge instruments, needles, etc. The transfer forceps (fig. 4) will also prove to be a great asset in the handling of sterilized instruments. Contamination of these forceps is not easy due to the construction, and one is able to handle a small needle or heavy retractor with the greatest of ease. The sterilization of suture material may be accomplished by chemical sterilization, by boiling, or by steam under pressure. The suture jar (fig. 5) is a good container for holding suture material in tubes. Here, by using 70 per cent alcohol, one is able to



Fig. 2—A sterilizer for large instruments.

keep the tubes immersed, the specific gravity being such as allows the tube to sink to the bottom of the jar. If sterilization of ampules is contemplated, it is best to add 0.1 per cent eosin, thus coloring the solution. If there should be a break in the ampule, the antiseptic solution finds its way into the contents of the ampule. This can be detected by the color. For convenience, not more than two types of suture material should be stored in one jar. Sterilization



Fig. 4—The Bard-Parker sterilizing tray and transfer forceps.

of silk, nylon, and cotton with steam under pressure or boiling is a very efficient method but one must take care not to wind the suture material too tightly on the spool as it will shrink. Thus, if wound tightly, this contracture will greatly reduce the tensile strength.

For disinfecting the skin, too often we

ization can be enhanced by the use of modern equipment.

PREPARING THE HANDS FOR SURGERY

In properly preparing the hands for any type of surgery, it would be well for the practitioner to remember that this tissue contains many transient and resident bacteria. A good scrub brush, a germicidal soap, and time are three requisites for properly preparing the hands. As has been said before, cocoanut oil soap is probably the one of choice. The germicidal action of the soap will destroy some of the resident bacteria and it forms a good lather, making scrubbing easier and aiding in emulsifying fats and oils. The scrub brush may be composed of either hog bristles, which cannot be autoclaved or boiled, but can be in continuous soak with such antiseptic as aqueous zephiran 1:5,000; or nylon bristles, which can be autoclaved at least 300 times at 250 F., 15 lb. pressure, for thirty



Fig. 5—This sterilizing jar holds suture material in individual tubes.

forget the value of soap and water and try to sterilize this tissue by applying antiseptic over dirt or grease. One should first scrub the skin with a soap that will have some germicidal action, such as cocoanut oil soap. After rinsing the area free of soap, dry it with ether to insure removal of all soap, etc., then apply the antiseptic. My present choice is tincture of iodine, followed with 70 per cent alcohol. In no case should these antiseptics be rubbed on the area, simply painted on. No matter which antiseptic is chosen, the thought should be ever present that complete sterilization does not occur immediately, but that at least thirty minutes will be required to kill vegetative organisms and eighteen hours to kill spores. Also, that the presence of grease, blood, pus, etc. will greatly decrease the value of the antiseptic. The value of chemical steril-

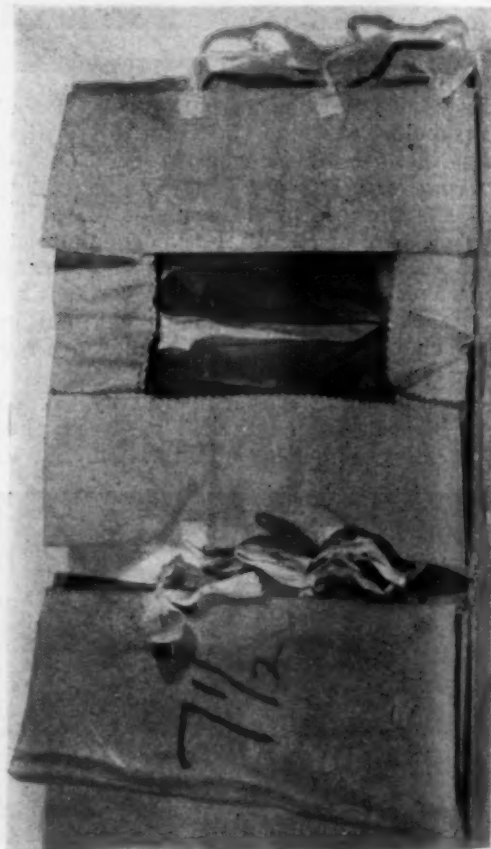


Fig. 6—Glove packets for autoclave sterilizing.

minutes. The brush composed of vegetable bristles is too soft and after being used once can be considered valueless. One should not be content to scrub less than ten minutes.

The busy practitioner will find the disinfecting of the hands probably one of his greatest problems in following aseptic technique. It is difficult for him to choose what cases he may have to work upon prior to performing a surgical operation. With this in mind, I believe that it is extremely important that he use rubber gloves. If he is fortunate enough to have an autoclave he may package the gloves as shown in figure 6. Talcum is less efficient as a glove powder than potassium bitartrate (cream of tartar) because of the more damaging effect to the tissues. About 1 Gm. of the powder should be placed in the meshes of a gauze sponge and sterilized with the gloves. This can be used as the dusting powder for the hands when applying the gloves. If the pressure cooker is used as the means for sterilizing textile material, thus preventing the sterilization of gloves in this manner, the wet glove technique should be adopted. It must be remembered, however, that even in wet glove technique it is proper to autoclave the gloves prior to putting them in solution, but the practitioner can

easily. Be sure to fill the glove with the antiseptic solution before inserting the hand, turning the hand upward as the last step in expressing the solution from the glove after it is on the hand.

PACKAGE STERILIZATION

Figure 7 shows a packaged set-up consisting of two hand towels, two gowns, eight shroud cloths, and 20 gauze sponges. Time is saved in making one large package instead of individually packaging the contents. I would not advise large package sterilization in a pressure cooker as the drying procedure is relatively slow and a large package would be more apt to become contaminated during the drying process. In carrying out aseptic technique, it would require four shroud cloths, each being folded double, and one laparotomy sheet to properly drape the patient. In modifying the aseptic technique, especially where help is lacking, many practitioners will probably elect to use a double thickness laparotomy sheet as the only means of draping the patient. The instrument table should likewise have a double thickness drape over it before receiving the instruments.

Shrouds, laparotomy sheets, etc., can be made out of sheets or medium weight unbleached muslin. Due to "light" reflection



Fig. 7—A package set-up for major surgery.

modify this somewhat by allowing the gloves to remain in antiseptic solution for thirty minutes. The solution of personal choice would be one derived from quaternary ammonium salts in a 1:5,000 solution. There seems to be just sufficient lubricating action to this group of antiseptics to allow the glove to slide on the hand

from white cloth, it is advisable to dye the material a darker color by using an Erie fast dye. This can be done during the laundering process.

CONCLUSION

In conclusion, let me reemphasize the need for more practical application of aseptic

technique and better sterilization in our everyday veterinary practice. If aseptic technique is to be symbolized as the pillar of modern successful surgery, let's not attempt it half-heartedly but realize that the more care we exercise in the selection of technique, the more successful we are bound to be as individual practitioners and as a profession.

Third Cesarean Section on a 2-year-old Cat

This is a description of a third cesarean section performed on a 2-year-old cat. A brief account of the history follows.

The cat was first brought to my office on Oct. 8, 1947, with a history of dystocia for twenty-four hours, and a first cesarean section having been performed by a local veterinarian six months previously. After delivering the first kitten, examination of the pelvic cavity revealed that the pelvic outlet was obstructed by a badly deformed pubis. Although the prognosis was unfavorable, I proceeded with the cesarean section, removed 3 more dead kittens, and discharged the cat in good condition seven days later.

Six months later, on Apr. 7, 1947, the same cat was brought to my office with the hind quarters of a fetus extruding. The fetus was already undergoing pronounced putrefaction. The odor was extremely powerful. I informed the owner that the prognosis was highly unfavorable, but at his insistence a third cesarean section was performed.

After administering nembutal, the abdomen and flanks were shaved, disinfected, and properly draped. The incision was made close to the linea alba and the uterine horns brought out. The body of the uterus was incised close to the bifurcation, and the moment the incision was made, the escaping gas filled the operating room as if a putrid stench bomb had been released. The partly protruding fetus was the only one, and it had to be pulled back into the horn for removal, making the operation more risky.

About 2 Gm. of a powder containing 80 per cent urea, 5 per cent sulfanilamide, and 15 per cent sulfathiazole, was dusted into the horn, which was then sutured with a gastrointestinal welded-on needle, using a double row of continuous Lembert-Czerny

stitches to bring the peritoneal surfaces in apposition.

More of the powder was dusted into the abdominal cavity, and followed by 25,000 units of penicillin in solution. The peritoneum was closed with a continuous suture of No. 1 plain catgut and reinforced with two interrupted stitches. The skin was closed with several interrupted silkworm sutures through the skin, muscles, and peritoneum.

Dextrose and saline, vitamin B₁, and niacin, were given twice daily, and 15,000 units of penicillin injections were given intraperitoneally and subcutaneously every four hours.

The first two days after the operation, we force-fed 2 oz. of milk five times daily at intervals of three hours. The cat retained this food, and on the third day started to drink milk unassisted. We gradually discontinued using the penicillin and stopped entirely on the fourth day. On the fifth day, the patient began to fail rapidly, showing symptoms of dehydration and septicemia. We started again to administer 20,000 units of penicillin with dextrose and saline every four hours. The cat responded favorably.

On the seventh day, the sutures were removed and the patient sent home. Three days later, when brought back for reexamination, she was in very good condition. The case of a cat undergoing three cesarean sections with complete recovery seems unique, and can be attributed to the prolonged use of penicillin and conscientious postoperative care, in conjunction with proper surgical technique. — *Salo Jonas, D.V.M., New Haven, Conn.*

Fertility at High Altitudes

Living at high altitudes has no effect on the reproductive ability of animals, comparative experiments with rodents showed. Prof. C. R. Moore,* of the University of Chicago, kept colonies of rats, mice, and hamsters at altitudes ranging from 600 ft. to 14,260 ft. At all levels, they reproduced freely and grew well to similar sizes and weights. There were no signs of sterility, and growth to sexual maturity was about the same at all altitudes. The only abnormality observed was that female mice had less milk at the highest altitude and some devoured their own offspring.—*Sci. News Letter, Jan. 10, 1948.*

Dilatation of the Esophagus in a Cocker Spaniel

ROBERT H. FITTS, D.V.M.

Chagrin Falls, Ohio

A SHORT WHILE ago an interesting case was presented at our hospital—a case of dilatation of the esophagus. By definition, this means an enlargement in the form of a cul-de-sac at some point in the esophagus. The term may be applied to any size sac but in this case, to the entire length of the esophagus extending from the pharynx to within an inch of the diaphragm.

In small animal practice this condition is unusual. The literature on the subject is vague. In the information available, the etiologic factor is generally described as an "injury to the muscular coat of the esophagus allowing a stretching of the mucous coat." In this particular case, the condition appeared to be congenital.

The anamnesis was interesting. The subject was a male Cocker Spaniel, 6 months of age. The owner obtained the dog when it was 2 months old and was told nothing of its unusual condition. The owner noticed immediately that,

for which the animal was treated. As there was no improvement, another opinion was sought. The second diagnosis was nervous stomach from which the patient would recover with maturation. Sedative and nausea tablets were dispensed.

Upon admission to our hospital the following factors were studied: (1) previous diagnosis and treatment were noted; (2) the animal's temperature was normal; (3) dehydration was marked; (4) the dog's desire to eat; (5) the disposition was excellent; (6) bowel movements were described as "few but normal"; (7) the lungs were auscultated but due to the labored breathing no definite opinion was expressed; (8) the abdomen was tucked-up and the viscera on palpation felt small and hard; (9) it was possible to feel the origin of the penis and outline its course, the accessory penile glands were very perceptible; (10) there was no nasal or ocular discharge; (11) the supraorbital fossae were sunken; (12) the ribs and bony protuberances were prominent; (13) the animal's general condition was one of marked

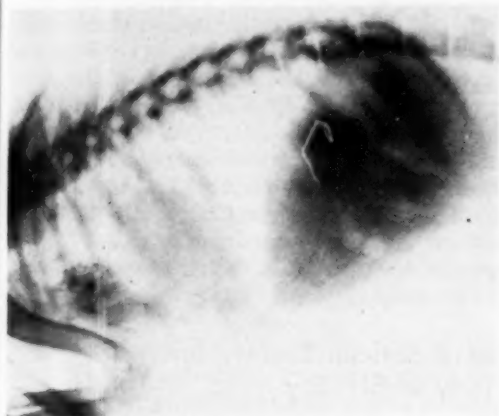


Fig. 1—Demonstrating the presence of foreign bodies in the anterolateral portion of the thoracic cavity.

although the animal was hungry, it could not keep anything down when fed. Within five minutes after eating and drinking, it would vomit the entire intake. As this condition continued for several days, the animal was fed goat's milk. For two weeks, the milk was kept down. Thereafter, goat's milk and other food was vomited within a few minutes.

At this point, the animal was taken to a veterinarian for medical care. Two different diagnoses were made. One of canine distemper

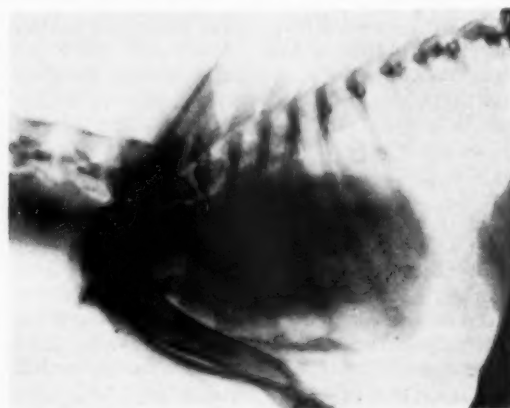


Fig. 2—The extent and dimensions of the dilatation disclosed by the instillation of barium sulfate.

dehydration and the emaciation of starvation.

Since it was felt that a period of observation was necessary, the animal was hospitalized. During the first two days, the patient was given as much normal saline solution subcutaneously as it would take. Intravenous injections of dextrose were administered. The patient's appetite was excellent during these two days. He exhibited the symptoms that the owner had described—ingestion followed by vomiting in a few minutes.

On the morning of the third day, an x-ray examination was made of the lower cervical region and the anterior part of the thoracic cavity. This was a lateral plate (fig. 1) which demonstrated the presence of foreign bodies in the anterolateral portion of the thoracic cavity.

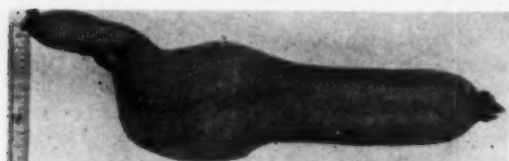


Fig. 3—Photograph of the lesioned esophagus after removal.

It was observed here that the foreign bodies shown could not be in the stomach unless a diaphragmatic hernia existed. This condition was not considered owing to the type of breathing typical of such cases and the inability to reduce the distress by lifting the patient by the front legs.

A gastroscope was passed, under general anesthesia. It was found impossible to pass the gastroscope beyond the level of the cul-de-sac. The passage caused the heart beats to increase in force and number and the distal end of the gastroscope to move with each beat of the heart. Foreign bodies, small stones in sizes varying from mere grains to the size of a small pea, were found (fig. 1).

The foul smell of the liquid contained in the esophagus indicated that it had been there for some time. The odor was attributed to the fact that there was no gastric juice in the diverticulum to prevent the putrefaction. The foreign bodies were removed by lavage. Another x-ray showed that the foreign bodies had been removed.

The next morning small amounts of food, given at hourly intervals, were kept down, but about noon vomiting began again. It was now observed that a slight filling at the lower third of the neck took place after feeding. When fed a large quantity of meat, the filling was more pronounced. The filling had escaped detection as it was the first time the patient had been fed a large amount. Shortly after the large feeding was vomited, the filling disappeared. This trial was repeated with identical results.

At this juncture, the patient was given a barium sulfate meal in milk which he readily consumed. The result is shown in figure 2. It will be noted that no foreign bodies show up in this photograph, that an outline of the esophagus and its dilatation can be readily detected, and that the barium sulfate showed the absence of foreign bodies.

A diagnosis of a dilatation of the esophagus was made and a grave prognosis rendered. The owner was advised that the patient could not

respond to treatment and that it should be put to sleep and a postmortem examination performed.

The autopsy revealed the following conditions: (1) The esophagus was enlarged from the pharynx to the base of the neck; (2) about 2 in. from the entrance of the thoracic cavity it began to get larger and just inside of the thorax there was a pronounced dilatation about 3 in. in diameter and 2 in. long attached to the heart. At the attachment, the esophagus began to narrow down to almost normal as it passed through the diaphragm; (3) there was no stricture at any point in the esophagus nor any evidence of any scars or foreign bodies; (4) in situ, the related organs appeared normal except that blood vessels were enlarged. The photograph (fig. 3), with a ruler, will give an idea of the size of the dilatation and the diverticulum.

The diagnosis of a dilatation was confirmed upon autopsy. Since there were no cicatrices, it was evident, in the light of the case history, that the condition was congenital.

SUMMARY

In summing up the case, we feel that it has been accurately portrayed, and wish to point out some factors that would be of value in diagnosing a similar case: (1) the great desire to eat and the inability to keep the food down; (2) the emaciated condition and the good disposition of the animal; (3) the filling of the cervical region upon eating and the reduction of the area upon vomiting; (4) the inability to pass the gastroscope directly into the stomach and its movements which corresponded with the rhythm of the heart; (5) the value of taking x-ray pictures with the use of barium sulfate to outline the cul-de-sac or objects such as wood which do not photograph well.

The American Society for the Study of Sterility

The meeting of this Society, which will be held at the Congress Hotel, Chicago, June 21, 22, 1948 (see Coming Meetings), will be open to all veterinarians interested in the study of sterility. Doctors of medicine, physiologists, and psychiatrists organized the Society, and this is the fourth annual national conference.

Fibrosarcomas are said to be far more frequent in sorrel mules than in mules of other colors or in horses.—*Vet. Med., May, 1947.*

A Newly Developed Anesthetic for Large Animals

E. W. MILLENBRUCK, D.V.M.

Carthage, Missouri

THE DISCUSSION of this anesthetic is a review of a paper published in the March, 1946, JOURNAL, by M. H. Wallinga, now of Cedar Rapids, Iowa, and myself,¹ with additional data collected in my practice at Carthage, Mo. It might be interesting to relate the history of the anesthesia and events which stimulated our desire to develop this product.

Shortly before I arrived at Fort Riley, Kan., the cavalry general and officer in charge of the Cavalry Replacement Training Center selected a spirited Thoroughbred weighing 1,200 lb., but failed to learn of the disposition of the horse before he made his decision. The general and his horse never returned together from a ride, but nevertheless he continued to ride to save face with his training officers. One day, the horse slipped and the general fell from his mount. The horse, returning alone to the stables, jumped a drainage ditch, failed to clear the obstacle, fell, and severely bruised a stifle. A few days later the wound had become abscessed and edematous.

To place the horse under anesthesia and remove or drain abscesses on the stifle, we administered 2½ oz. of chloral and 1¼ oz. of Mg S04, in 1,000 cc. of water, intravenously. This failed to produce any measurable degree of narcosis. We were able to lead the animal approximately 150 ft. into the colic ward, after which we attempted to cast him, but before we had finished the horse died.

We proceeded to the general's office to deliver what we thought was some very bad news, but he seemed rather pleased to hear that the horse had died.

In an attempt to find a safer and more suitable anesthesia we considered pentobarbital sodium. Advantages are its safety and its long operative period. However, the disadvantages are that the horse flounders badly, batters the head, and bruises the

eyes. Moreover, it requires approximately 1 gr. to every 6 lb. of body weight, so that the cost is prohibitive. One thing in favor of pentobarbital sodium is its action on the motor nerves, causing complete muscular relaxation, a good feature of any anesthetic.

Chloral hydrate in an 8 per cent solution was tried, but some high strung Thoroughbreds required 90 to 120 Gm. of the drug before narcosis occurred. We found that some horses were allergic to the drug and would die when the quantity was within the average dosage range. If used alone, chloral hydrate excites the animal, making it dangerous. Nevertheless, the depressing action on the sensory nerves after the excitement stage is favorable.

We then tried 2 parts of chloral hydrate and 1 part of Mg S04. The addition of Mg S04 greatly reduced the excitement stage, but complete muscular relaxation was not attained with this mixture. In order to overcome this condition and eliminate the need of a dangerous dosage for the animal, we attempted to give 1 oz. chloral, ½ oz. Mg S04, in 1,000 cc. of water which in most cases would relax the horse; then we would follow with 75 to 100 gr. of pentobarbital sodium.

Since we were satisfied with the individual action, i.e., nembutal for motor depressant, chloral for sensory depressant, and Mg S04 to reduce excitement stage, it was thought possible that the three drugs could be mixed and given simultaneously.

Surgical anesthesia was obtained with only about half of the drug previously used. The first thought was that experimental animals were old and more quickly anesthetized; but on further experimentation on young horses which the horseshoers could not handle, we were satisfied that the combined drugs induced a satisfactory anesthesia.

The ingredients and proportions of the newly developed anesthetic consist of 100 gr. nembutal, 1 oz. chloral, ½ oz. Mg S04, in 1,000 cc. water. This formula was originally decided upon since it was easy to compute the dose. Later, the proportions were changed but increasing any one ingredient produces no advantages. Mixing

¹Presented before the section on Surgery and Obstetrics at the Eighty-fourth Annual Meeting, American Veterinary Medical Association, Cincinnati, Ohio, Aug. 18-21, 1947.

²Millenbruck, E. W., and Wallinga, M. H.: A Newly Developed Anesthetic for Horses. J.A.V. M.A., 108, (1946); 148-151.

all of these together would, after a few hours, result in a precipitate. At first, it was thought this precipitate was the formation of a new drug. I took a sample of it to the Organic Chemistry Department, Kansas State College, Manhattan, which reported that the unstable double hydroxyl nature of chloral hydrate makes it very susceptible to formation of new compounds with other drugs and that a new drug might have resulted from the mixture. We found that it would cost about \$1,000 to have the drug analyzed, with no assurance from the chemist that he could tell whether a new drug had been formed. The analysis would show only quantitative and qualitative elements in the product. In an attempt to overcome the problem of the precipitate, we consulted Jensen-Salsbery Laboratories, Kansas City, Mo. Their chemist was of the opinion that no new drug had been formed. He believed that the substitution of pentobarbital acid in place of sodium pentobarbital would eliminate the precipitate. However, the insolubility of the acid would require the addition of propylene glycol and alcohol. His suggestion was found to be correct and these are the products used in the making of equi thesin as marketed by Jen-Sal Laboratories.

ADMINISTRATION

The prepared solution is given very slowly in the jugular vein by means of gravity flow, utilizing a 15-gauge needle and simplex intravenous outfit until the horse begins to stagger. Then, the flow is increased by raising the bottle until the horse is ready to fall. The needle is removed as the horse is falling. Effort should be made to keep the horse on his feet as long as possible; however, when the horse has fallen, the halter rope should be held tightly for a short time so that he does not attempt to rise. The nystagmus and corneal reflexes are the predominant guides for determining the dosage. When the oscillatory movement of the eyeball almost stops and the animal takes a deep breath, the stage of surgical anesthesia has been reached.

PERIOD OF SURGICAL ANESTHESIA

There is complete immobility during the short period of surgical anesthesia. With the small dose required to get only a slight

corneal reflex, the surgical stage lasts about thirty minutes. Since the length of the profound narcosis can be controlled by the amount administered, more or less is given in accordance with the operation to be performed. In cases where immobility is desired for x-ray work or operations of short duration, a minimum dose will keep the horse under complete anesthesia for fifteen to thirty minutes, whereas an additional 15 per cent will produce that stage in the horse for forty to sixty minutes.

PERIOD OF COLLAPSE OR COMPLETE INTOXICATION

The period of collapse or complete intoxication has not been a factor of concern because of the low toxicity. No special care has been taken to stop the administration until the surgical stage is reached. The new product has been used on approximately 250 cases without a death.

PERIOD OF RECOVERY

The patient recovers rapidly and regains consciousness at about the same rate that it regains muscular coordination. The throwing of the head and floundering that is particularly noticeable with pentobarbital sodium or chloral hydrate is absent. The horse seldom makes an attempt to rise until he is capable of doing so. The time required for a horse to stand after an injection is usually about one hour.

TOXICITY

The toxicity is negligible, and the range of safety appears to be 100 per cent over the average dose. The average dose administered in all the cases carefully recorded consisted of 67 gr. pentobarbital sodium, 20 Gm. chloral hydrate, and 10 Gm. magnesium sulfate. A horse which weighed 1,090 lb., the average weight of all the horses used, was given twice the average dose and still lived in a profound narcosis on only two breaths per minute.

In addition to the numerous cases on which it was used in the Army, I have used it in my practice for the following conditions.

In Horses.—Castration, 75; dental work, 10; arresting hemorrhage, 2; examination of joint opening, 1; correction of patellar luxation, 2. We found anesthesia to be the only equipment needed to correct a "stifled horse," because as the horse relaxes, he

falls on the leg, further relaxing the tension on the ligaments so that the patella slips back easily. The animal remains down for about thirty minutes allowing soreness to leave—an advantage over reduction by mechanical manipulation.

In Cows.—I refrain from using it on a lactating cow because of the danger of falling on the udder and bruising it. I have used it on bulls to trim toes, on heifers to remove actinomycotic abscesses, on a calf to reduce umbilical hernia, and for very severe lacerations of teat and udder. When using it on a cow, I deduct the estimated weight of rumen content from the weight of the cow in order to estimate the amount of anesthetic necessary, the requirement being the same as that for horses.

In Hogs.—I have used it on a few cases of scrotal hernia after having 1 pig die on nembutal only. I use 1 cc. of equi thesin per 3 lb. of pig weight injected into the ear vein.

In Dogs.—Equi thesin has been successful in cases where a somnifacient effect was desirable, and safety important, as in suturing wounds, setting fractures, removing Harder's glands, clipping, etc.

CONCLUSION

I do not think this is a perfect anesthetic. However, its advantages, *i.e.*, low toxicity, reduced excitement stage, short surgical stage, rapid recovery period, surgeon being his own anesthetist, small amount of equipment necessary, and low cost, outweigh its disadvantages. The prod-

uct is such that it requires professional knowledge to use it, I am glad to say.

Castration of a Tiger Improves Ferocious Temperament*

The tiger belonged to the Animal Department, Gwalior, C. L., India. Having become ferocious and in poor health, he was



Veterinary Officer Laxman Castrating a Tiger in India.

castrated to improve his temperament. With strong ropes the legs were stretched backward and forward and the head raised. See figure.

The testicles were exposed by one incision and removed after ligating the spermatic cords. Healing was complete in three weeks. The importance of the case was the marked improvement in the animal's disposition and general health.

*Capt. M. P. Laxman, RAO, G.B.V.C., Veterinary Officer, Palace Stables and Dairy, Gwalior, C. L.: "Castration of a Tiger," *The Indian Vet. J.*, 24, (Sept., 1947):230-231.



—Acme Photo

Quintuplets born to Elsie, a 4-year-old Nubian goat. The kids weighed about 30 lb. Twin goats are common, and there are occasional triplets, but quintuplets are rare.

CLINICAL DATA

Clinical Notes

Critical tests have revealed that metaphen, merthiolate, and mercurochrome have been over-rated as germicides for touching up fresh cuts.—*From J.Am.M.A., Jan. 3, 1948.*

Tap water is a source of contamination and any glassware or tubing rinsed or washed in it will produce pyrogen unless sterilized within an hour.—*Dr. L. Rademaker, J.Am.M.A., Dec. 27, 1947.*

Streptomycin.—There is little doubt that streptomycin now stands at the top of the antibiotics but its availability for veterinary use lies in the unpredictable future, for it is not yet available for general use in human medicine.

Pneumoencephalitis Vaccine.—The Massachusetts Agricultural Experiment Station (*J.A.V.M.A., Feb., 1948: 131-132*) announces a new vaccine which may be used by the "stick method" to protect fowl against pneumoencephalitis (Newcastle disease).

Theory on Malignancy.—Benign and malignant tumors may be manifestations of the same neoplastic principle, the benign tumor or cell representing an arrested or inhibited stage of a potentially malignant process.—*A. C. Ivy, M.D., Science, Nov. 14, 1947.*

Potato-Stalk Poisoning.—The feeding of potato vines (stalks) to cattle causes solanine poisoning with symptoms that may be mistaken for those of foot-and-mouth disease: mouth lesions and ulcerations of the interdigital region. Other symptoms are swollen joints and exanthema of the legs and udder. The poisoning was reported officially by the veterinary officers of the U. S. Army of Occupation in Bavaria where farmers, in the absence of other roughage, resorted to the feeding of potato vines.—*From Veterinary Section, Public Health Branch, Military Government for Germany, July, August, September, 1947.*

Salmonella Pullorum in Eggs.—Of 1,000 eggs laid by pullorum reactors in an Ontario study, 61 contained *Salmonella pullorum*.—*Biol. Abstr., Oct., 1947.*

Keep the Brooder-House Stove Burning.—When warm spring days come along do not be too hasty about extinguishing the brooder-house stove because moisture favors the propagation of coccidiosis among the chicks that have weathered the ailments of their earlier life.

Bone Marrow in Laboratory Work.—In the diagnosis of typhoid fever, bone marrow (sternal puncture) is more likely to yield cultures of the specific organism than the blood, especially after the first week (*Arch. f. Kindkd., June, 1947. Abstr. J.Am.M.A., Feb. 7, 1947:427*). European animal pathologists prefer bone marrow (long bones) to other specimens for bacteriologic examinations.

Commercial Fertilizer vs. Livestock.—The best that can be said of commercial fertilizer as a means of stepping up the productivity of land is that it is but "a shot in the arm," while the least that can be said of livestock in that rôle is that theirs is a more permanent gift. Moreover, nutritionists agree that plants forced by artificial fertilization have lower nutritive values than those of livestock-fertilized land.—*From Harper's Magazine.*

Roundworm Treatment for Kittens.—Tetrachlorethylene is the treatment of choice for roundworm infestation in cats less than 1 year old. It should be given in capsule form, 0.1 cc. per pound of body weight, following a period of fasting sufficient to empty the stomach. Food and water should be withheld for two hours after the drug is given. This treatment is not recommended for kittens under 2 months of age. If necessary, a second dose may be given seven to ten days later.—*Vet. Rec., Dec. 20, 1947.*

Diseases and Ailments in Suckling Pigs

Report of Committee

Due to unsettled printing conditions, it was not possible to publish this report in the April, 1948, JOURNAL along with the Committee's excellent tables on differential diagnosis of the diseases and ailments of suckling pigs (see insert, April JOURNAL, opposite p. 306). Because the tables were so timely, we believed it advisable to publish them in the April issue, even though they could not be correctly identified. This Committee was appointed by Dr. L. P. Doyle, chairman of the conference on losses in baby pigs, which was sponsored by the American Feed Manufacturers' Association and the AVMA. (See also report of Committee on Management and Nutrition, p. 392.)

It is the purpose of this paper to summarize current knowledge of the diseases which afflict suckling pigs in an attempt to aid the practitioner in the diagnosis of such diseases. Because of the variations manifested by a single disease entity as a result of the complexities of the host-parasite environmental balance, any diagnosis in the field is difficult. Adding to the difficulty is our incomplete knowledge of the causes for many of the losses incurred in suckling pigs. It is true that advances have been made toward an understanding of the factors responsible for baby pig losses, but a great deal yet remains to be learned.

Perhaps the greatest confusion at present is within the hypoglycemia, uremia-toxemia, "three-day-sickness" type of ailment. The descriptions of these diseases are very similar, and there is some evidence that they may all be manifestations of a single disease. At present, majority opinion holds that these diseases are the result of inadequacies in the diet of the dam and/or poor management. However, the minority opinion that these diseases may be brought about by viral infections of dam or pigs cannot be ignored. Such differences in opinion show that a full understanding of baby pig losses is lacking, which, from the standpoint of stimulating further research, is a healthy situation. Further research on these problems from both nutritional and disease points of view should eventually clarify the picture.

Tables 1 and 2 (see insert, April JOURNAL) show the clinical symptoms and postmortem changes which occur in the more important diseases of suckling pigs. It is apparent that differential diagnosis is almost impossible without the aid of laboratory facilities, and even then it is not always possible. This is especially true in pigs less than a week old, since the symptoms and postmortem lesions are similar for most of the ailments. It will

be necessary, therefore, for the practitioner to rely largely on herd history and his own good judgment in diagnosing diseases of suckling pigs.

S/GEO. A. YOUNG, *Chairman*

H. E. CAMERON

H. C. H. KERKAMP

B. H. EDGINGTON

S. H. McNUTT

FRANK THORP

Sulfadiazine and Streptomycin in Human Brucellosis

The sulfonamide, sulfadiazine, and the antibiotic, streptomycin, the first given *per os* and the other intramuscularly, gave promising results in human brucellosis in trials conducted at the University of Minnesota hospitals. The streptomycin was given in 0.5-Gm. doses every six hours for seven days along with an initial 4-Gm. oral dose of sulfadiazine followed with 1-Gm. oral doses every four hours for two to three weeks. Data covering the details of the treatment were published in the *Journal of the American Medical Association*, Feb. 7, 1948.

Pathogenesis of Brucellosis. — Mexican studies showed that the *Brucella* organism can use the cytoplasm of a variety of cells as a source of material for growth. In infected guinea pigs, *Brucella* grows in large numbers in the cytoplasm of macrophages, fibroblasts, and endothelial and reticular cells. When such an extracellular colony reached its maximum, the cell was destroyed and the organisms were exposed to unfavorable conditions, such as phagocytosis by polymorphonuclear cells. Large numbers of extracellular *Brucella* were found in damaged tissue.—*Biol. Abstr.*, Oct., 1947.

Dominant Mink Diseases.—Autopsies held by Chaddock (*Am. Fur Breeder*, Jan., 1948) on 4,425 mink from 685 ranches in 28 states and Canada, over a period of ten years, give an insight into the disease problems that veterinarians serving that field are most likely to encounter. The data collected lists 89 causes of death. The dominant ones named on a descending scale were *pneumonia*, 947; *food poisoning*, 765; *fatty degeneration of the liver*, 630; *distemper*, 288; *malnutrition*, 256; *cystic calculi*, 182; *gastroenteritis*, 157; *generalized infection*, 140. The report was a reprint from *Veterinary Medicine*.

The Significance of Hypoglycemia

JESSE SAMPSON, D.V.M., Ph.D.

Urbana, Illinois

DR. JEROME W. CONN,¹ professor of medicine, University of Michigan Medical School, has stated, "Despite the years that have elapsed since attention was first directed to this syndrome [spontaneous hypoglycemia in human beings], physicians in general have not developed a sufficiently keen consciousness of its existence. As is the case with other conditions, those who are aware of the possibility of spontaneous hypoglycemia as a cause of symptoms recognize many cases, while those who are not, see none. Among the many erroneous diagnoses which have been made in this complex are brain tumor, epilepsy, acute alcoholism, encephalitis, neurocirculatory asthenia, cardiac neurosis, various psychoses, atypical angina pectoris, and peptic ulcer."

The foregoing statements prompt me to raise the question: Are we in veterinary medicine sufficiently conscious of the existence of spontaneous hypoglycemia in animals and do we recognize its significance?

A brief review of some aspects of the physiology of carbohydrate metabolism may prove helpful in this respect. The sugar normally found in blood is glucose. Except for a small amount which originates in the liver from lactic acid, practically all of the glucose ordinarily present in blood has one of two sources. These two sources are (1) food undergoing digestion and absorption in the digestive tract, and (2) glycogen stored in the liver. The work of Mann *et al.*² on the physiology of the liver showed that glycogen stored in muscle is not an available source of blood sugar (except the relatively small amount of lactic acid that escapes into the blood during contraction of muscle and is changed to glycogen in the liver as previously mentioned). Still another source of blood sugar, which assumes major importance in certain emergencies, is the process of gluconeogenesis or the pro-

duction of glucose from noncarbohydrate material such as protein. Reference will again be made to this source later in the discussion.

Although glucose provides a readily available source of energy for all tissues in the body, it appears to be of unique importance in this respect to the central nervous system. The brain, for example, apparently cannot utilize either fat or protein and is dependent entirely on glucose as a source of energy. Mann believes that glucose is not only required for normal physiology of the central nervous system, but that it is essential for life itself. According to this authority on hypoglycemia, glucose appears to be as irreplaceable as oxygen.

Glucose, in the form of glycogen, is present in heart muscle. Soskin and Levine³ point out that "in the heart which is damaged by disease and in which the initial glycogen stores are poor, hypoglycemia may precipitate stenocardial symptoms with angina and even result in death."

Glucose has still another important function. As glycogen stored in the liver, it shields this organ from injury by its protective and detoxifying actions.³

Again referring to the discussion by Dr. Conn,¹ this authority states that although there are many causes of low blood sugar, 80 to 90 per cent of clinical cases in man can be ascribed to one of three causes. These three causes are (1) functional hyperinsulinism, (2) organic hyperinsulinism, (3) hepatogenic hypoglycemia. The accompanying outline from Conn reveals the large variety of conditions that have been incriminated in the etiology of spontaneous hypoglycemia in human beings.

Knowledge of the causes of clinical or spontaneous hypoglycemia in domestic animals is not extensive. However, the available evidence seems to indicate that, as is apparently true for man, the chief etiologic possibilities are few. In short, our present evidence suggests that partial or complete inanition or fasting is probably the most common cause.

¹Presented at the 28th Annual Illinois Veterinary Conference and Extension Short Course, College of Veterinary Medicine, University of Illinois, Urbana, Oct. 6-9, 1947.

²Professor of Veterinary Physiology and Pharmacology, College of Veterinary Medicine, University of Illinois, Urbana.

ETIOLOGIC CLASSIFICATION OF SPONTANEOUS HYPOGLYCEMIA

- I) Organic—recognizable anatomic lesion
 - A) Hyperinsulinism
 - 1) Pancreatic island cell adenoma
 - a) Single
 - b) Multiple
 - c) Aberrant
 - 2) Pancreatic island cell carcinoma
 - a) Localized
 - b) With metastases
 - 3) Generalized hypertrophy and hyperplasia of the islands of Langerhans
 - B) Hepatic disease
 - 1) Ascending infectious cholangiolitis
 - 2) Toxic hepatitis
 - 3) Diffuse carcinomatosis
 - 4) Fatty degeneration or "fatty metamorphosis"
 - 5) Glycogenosis (von Gierke's disease)
 - C) Pituitary hypofunction (anterior lobe)
 - 1) Destructive lesions (chromophobe tumors, cysts)
 - 2) Atrophy and degeneration (Simmonds' disease)
 - 3) Thyroid hypofunction (? secondary to pituitary hypofunction)
 - D) Adrenal hypofunction (cortex)
 - 1) Idiopathic cortical atrophy
 - 2) Destructive infectious granulomas
 - 3) Destructive neoplasms
 - E) Central nervous system lesions (hypothalamus or brain stem; interference with nervous control of blood sugar)
- II) Functional—no recognized anatomic lesion but explainable on basis of unusual somatic function
 - A) Hyperinsulinism (imbalance of the autonomic nervous system): hypoglycemic fatigue; nervous hypoglycemia; functional hypoglycemia; reactive hypoglycemia
 - B) Alimentary hyperinsulinism (rapid intestinal absorption)
 - 1) After gastroenterostomy
 - 2) After gastric resection (partial or total)
 - C) Renal glycosuria (severe degrees of low renal threshold for dextrose)
 - D) Lactation
 - E) Severe continuous muscular work
- III) Miscellaneous
 - A) Factitious (surreptitious insulin administration)
 - B) Postoperative hypoglycemia
 - C) Severe inanition
 - D) Unknown

FASTING HYPOGLYCEMIA

With reference to fasting hypoglycemia in man, Conn⁴ says:

Those conditions, which are characterized by an abnormally low fasting blood sugar level and in which the hypoglycemia is intensified by restriction of carbohydrate or by fasting, are more easily understood. Into this group fall the following causes of spontaneous hypoglycemia: hepatogenic hypoglycemia, hypopituitarism, adrenal cortical hypoglycemia, and prolonged inanition. In all, the fasting hypoglycemia results from an unavailability of sufficient carbohydrate to support tissue requirements for oxidation over any prolonged period without food. The mechanism may vary, but the result is the same. For example, in hypopituitarism and in Addison's disease, tissue requirements for glucose are increased and glycconeogenesis from protein is diminished. Thus, after the usual overnight fasting period, the blood sugar is likely to be low. Omission of meals or restriction of carbohydrate produces more severe hypoglycemia. In renal glycosuria and in lactation with hypoglycemia, glucose is either lost from the body or converted to something else. Impairment of the normal glycogenic and glycogenolytic functions of the liver leads inevitably to a fasting type of hypoglycemia. In all of these conditions a diet high both in carbohydrate and in protein is indicated. Of greatest value in these cases is the provision of a bedtime meal. This shortens the overnight fasting period and protects against pre-breakfast hypoglycemic attacks.

It is doubtful if all of the foregoing statements of Conn are relevant to spontaneous hypoglycemia in domestic animals, but one statement especially seems applicable to the hypoglycemia so often associated with clinical ketosis or acetonemia of cows and ewes. (It is probably applicable, also, to clinical ketosis in sows and goats.) This statement is: "In all, the fasting hypoglycemia results from an unavailability of sufficient carbohydrate to support tissue requirements for oxidation over any prolonged period of time without food." Clinical observations clearly indicate that as soon as cows and ewes affected with spontaneous or clinical ketosis have a good appetite and begin to consume liberal amounts of feed, particularly of concentrates such as corn and oats, ketosis is dissipated and blood sugar returns to normal. It is usually advisable, of course, to give intravenous injections of dextrose because this hastens the return to normal. Unless the syndrome

is too advanced or is complicated by some other disease that does not respond to appropriate treatment, symptoms also disappear and the animals recover.

It is not known at this time to what extent Conn's statement, that impairment of glycogenic and glycogenolytic functions of the liver leads to hypoglycemia, is applicable to spontaneous hypoglycemia in clinical ketosis of cows and ewes. This aspect of hypoglycemia in cows and ewes merits further study.

A form of spontaneous fasting hypoglycemia presumably caused by impairment of the glycogen function of the liver is observed in the Snowshoe hare affected with so-called shock disease.⁵ In this disease, liver damage causes a failure of glycogen storage as well as glycogenetic activity of the organ.

HYPOGLYCEMIA OF NEWBORN PIGS

In spontaneous hypoglycemia of newborn pigs (so-called baby pig disease), fasting or inanition is believed to be the chief etiologic influence.⁶ However, hypoglycemic coma is frequently observed in pigs that have a large mass of solid curd in the abomasum. In this group of pigs, lack of normal gastrointestinal activity is believed to be the predisposing influence leading to hypoglycemia. The cause of the lack of normal stomach motility and impairment of digestive and absorptive processes in these pigs has not been determined. At the present time it is also not known whether there is impairment of the glycogenetic function of the liver in hypoglycemia of newborn pigs or whether this process is delayed. Research on these and other aspects of hypoglycemia in baby pigs is now in progress.

It is evident that progress is being made with reference to a recognition of the importance of spontaneous hypoglycemia in domestic animals, but it is equally evident that this syndrome deserves increasing attention in veterinary medicine.

References

- ¹Conn, J. W.: The Diagnosis and Management of Spontaneous Hypoglycemia. *J. Am. M. A.*, 134, (1947): 130-137.
- ²Mann, F. C.: I. Studies on the Dehepatized Animal. A Review. The William Henry Welch Lectures. *J. Mt. Sinai Hospital*, 11, (1944): 1-22.
- ³Soskin, S., and Levine, R.: Carbohydrate Metabolism. University of Chicago Press, Chicago (1946).
- ⁴Conn, J. W.: The Dietary Management of Spontaneous Hypoglycemia. *J. Am. Dietetic A.*, 23, (1947): 108-112.
- ⁵Green, R. G., and Larson, C. L.: A Description of Shock Disease in the Snowshoe Hare. *Am. J. Hyg.*, 28, (1938): 190-212.
- ⁶Sampson, J.: Diseases of Young Pigs with Special Reference to Acute Hypoglycemia. Abstracts of Papers Presented at the Twenty-first Annual Short Course for Veterinarians at the University of Minnesota, University Farm, St. Paul, Nov. 1-2, (1944): 1-5.

Equine Leptospirosis

Lubashenko and Novikova¹ describe an outbreak of acute equine leptospirosis. The temperature was high for two or three days, returning to normal or subnormal with the appearance of icterus. Petechiae occurred on the visible mucosae. Urination was frequent, often accompanied by straining, but the urine did not become colored with hemoglobin until the terminal stage. The hair fell out, leaving bald spots on the back. The blood picture showed progressive hemolysis: erythrocytes 3 to 3.5 millions, anisocytosis, leucocytes 12,000 to 16,000, neutrophilia with a shift to the left. The course was five to eighteen days, and the mortality 40 to 60 per cent. Peracute, subacute, chronic, and atypical forms are also described.

Leptospirosis must be differentiated from nuttalliosis, piroplasmosis, and infectious anemia. The first two diseases can be eliminated by examination for parasites in the erythrocytes, and by specific treatment. They also cause enlargement of the spleen, as does acute infectious anemia. Leptospirosis does not. Specific agglutinins appear in the blood on the eighth day, in cases of leptospirosis, and persist for 150 days. Titers range from 1:5,000 to 1:40,000. A titer lower than 1:400 is not considered positive. Twelve case were treated with antiserum—100 cc. subcutaneously. Three horses received a second dose on the third day. Ten of the horses recovered.

On another farm, 5 horses were successfully treated with antiserum, and the remaining 77 horses and colts were vaccinated with a vaccine prepared by the authors. No cases were observed among the vaccinated animals.—*R. E. Habel.*

¹Lubashenko, S. Y., and Novikova, L. S., Central Research Lab. for Fur Production, USSR: Symptoms, Diagnosis, Prophylaxis, and Therapy of Equine Leptospirosis. (Title translated). *Veterinariya*, 24, (Aug., 1947): 7-11.

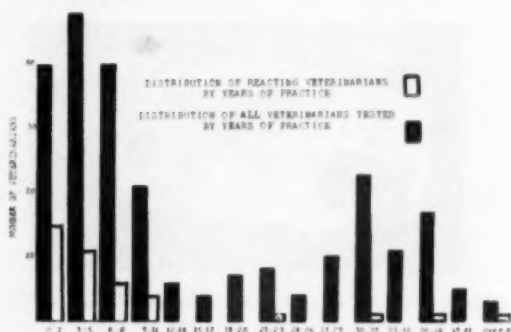
Brucellosis Survey at Cincinnati Annual Meeting

During the eighty-fourth annual meeting of the AVMA in Cincinnati last year, blood samples were drawn from 252 of the veterinarians attending. These samples were tested for brucellosis by the Indiana State Board of Health, and their tabulation of the results provides interesting information.

Of the total number tested, 61 (24.3%) showed some reaction, and 43 (17.3%) reacted at a dilution of 1 : 80 or higher, which is considered to be a positive reaction. Of the total number tested, 52 persons (20.6%) volunteered a history of undulant fever, but only 9 of these still reacted. Similarly, 66 (26.2%) of the total number said they had been drinking raw milk, but again only 9 of these were classed as reactors.

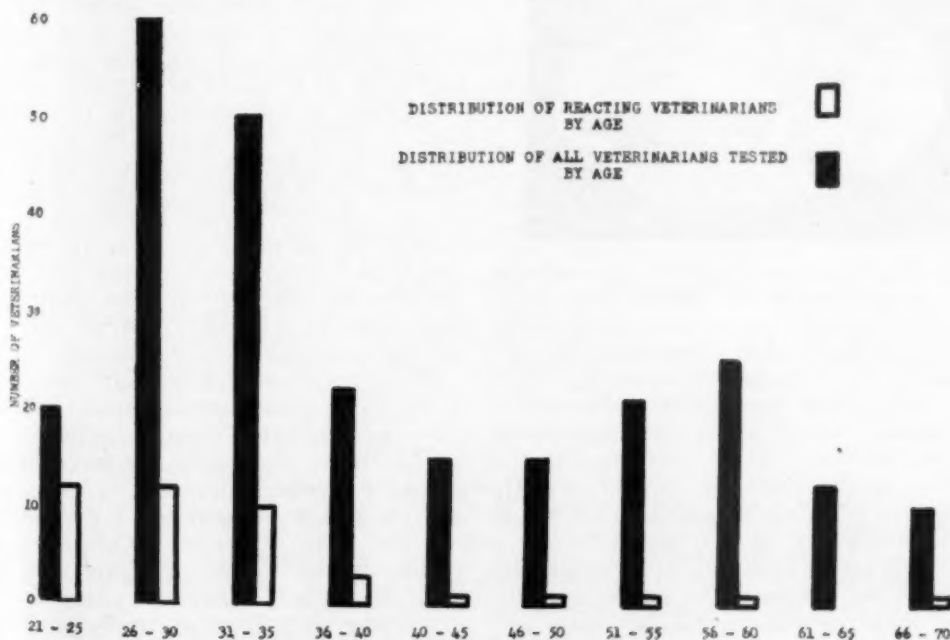
Perhaps the most interesting fact shown by the survey is the preponderance of reactions among the persons who have recently entered practice. Whether this is an indication of a growing resistance following repeated exposure, or whether it is an indication of the accumulation of "blocking" antibodies is difficult to determine. The blocking properties of the serums are now being investigated at the National Institute of Health.

The data are being subjected to critical statistical analysis to determine the influence of the age of the veterinarian, the length of time in practice, the percentage of time spent with large animals, and the ingestion of raw milk upon the presence of agglutinins.



Graph 2—Range of years in practice of veterinarians in the brucellosis test survey.

Quite naturally, the data cannot be considered representative of veterinarians in all sections of the United States, because most of the persons tested reside in Ohio or the states which adjoin it. Plans are being formulated to continue the survey in San Francisco this year, in Detroit in 1949, and in other cities where the AVMA conventions will be held.—*Raymond Fagan, D.V.M.*



Graph 1—Age range of veterinarians in brucellosis test survey.

"Slobbers" in Chinchillas

Dr. E. R. Quortrup, U. S. Fish and Wildlife Service (*National Fur News*, Jan., 1948), gives a scientific explanation of the serious slobbering condition not infrequently reported by chinchilla breeders. A critical investigation of a case revealed a



Fig. 1—Normal relation of upper and lower incisors, allowing free motion of the mandible.

malocclusion supposedly of hereditary origin. The upper incisors failed to overlap properly the inferior ones, leaving the molar arcades to the mercy of abnormal attrition and development, with resulting chisel-like grinders that irritated and wounded the cheeks. The description corresponds to that of the brachygnathism (parrot mouth) and parvignathism (scissor mouth) that exist in the large herbi-



Fig. 2—The incisors overlapped in such a way as to interfere with free motion.

vores, especially of the soliped, which are malocclusions of major importance in breeding. The author suggests the invention of a speculum which would facilitate operative correction. As the only purpose for prolonging the life of a chinchilla is the production of offspring, perhaps the better course would be to pelt the slobberer to stop the passing of its genes to subsequent generations. Anyhow, the mares and stallions with such malocclusions have long been barred by horse breeders. As Prof.

W. L. Williams once said, "Animals with hereditary abnormalities ought to be shot not bred." He was speaking of parrot mouths, ridglings, hernias, and other congenital deformities. Without any knowledge whatsoever about the aristocrat of the fur bearers, this old conception of eliminating the maladjusted from the breeding string is passed along to ponder. That is, if the slobbering chinchilla is due to malocclusion the remedy is clear. The horse dentist is able to prolong the usefulness of the brachygnathic horse by trimming the lower incisors from time to time and watching the probable elongation of the sixth molars, but to conserve the subject for breeding is just not done—genetics forbid.

Colchicine in Mammary Tumors

In a series of 38 cases of medium-sized mammary tumors in bitches, 36 were benefited by colchicine injections and surgery was not required. Other cases involving large tumors usually were first treated with colchicine and operated upon about two weeks later, although some were not given the drug until after surgery.

The author, Chesney of England (*Vet. J.*, 103, Nov., 1947 : 387-390), stated that the medium-sized tumors were reduced to about two-thirds of original size, became indurated and sometimes nodular, and remained that way indefinitely. There were no fresh growths in any of these cases. In the cases of large mammary tumors removed surgically, supplementary use of colchicine was credited with preventing recurrence. It also appeared to suppress seedling or medium-sized growths in other glands.

The colchicine was administered in a series of six doses at intervals of three days, each dose being injected in a volume of 1 cc., as follows: two doses of 0.025 mg. each, two of 0.05 mg., and two of 1 mg. Initial reactions were depression, lethargy, and inappetence, lasting for about three days. The subcutaneous route was preferred to injection directly into the tumor, as the latter method caused pain that persisted for several days.

The author credited Dr. E. C. Amorosa, of the Royal Veterinary College, for devising the therapeutic technique and added that if work is continued along this line, "we may pave the way to the solution of the cancer problem."

The Pathology of So-Called Acute Tonsillitis of Dogs in Relation to Contagious Canine Hepatitis (Rubarth)

A Report of Five Cases

D. L. COFFIN, V.M.D.

Boston, Massachusetts

THIS PAPER reports the occurrence of an acute disease of dogs accompanied by fatalities not hitherto described in the United States.

During the past year, 5 cases of a disease having a distinctive gross and histopathologic picture were discovered at autopsy. Because of unique and strikingly similar tissue alterations in these animals, it became apparent that a pathologic entity was represented. Furthermore, a review of the history and symptoms suggested that here also an analogous clinical entity appeared evident.

As will be described in detail later, the tissue changes suggested an acute systemic virus disease. The most striking histopathologic changes, common to all 5 cases, occurred in the liver, lymphoid tissue, and endothelial tissue. The liver showed congestion, hemorrhage, necrobiosis, and numerous intranuclear inclusions in both the epithelial and endothelial elements. The lymphoid tissue, including the tonsils and spleen, exhibited extreme necrobiosis of the lymphoid cells, edema, and hemorrhage with a few inclusion bodies in the endothelial and reticulum cells. The endothelial tissue demonstrated irregular but general change consisting of swelling of the nuclei and the presence of intranuclear inclusions.

The symptoms occurring with regularity were malaise, either fever or a previous history of fever, soft gagging cough, watery discharge from the conjunctiva, swollen and reddened tonsils, loss of appetite, vomiting, and rather unexpected collapse and death.

REPORT OF THE BOSTON CASES

A 46-6. Boxer—Female—3 Months. 10-9-46.—This animal had been sick since the date of purchase four days before its death. Symptoms consisted of listlessness, anorexia, and repeated

attacks of vomiting and coughing. Death was sudden and resembled syncope. The animal had been treated with a sulfonamide and homologous serum following a diagnosis of tonsillitis by a private practitioner.

Two other pups from the same litter were affected with a similar illness. These were treated with penicillin and both recovered.

Autopsy.—The nutritional state was excellent. Edema and some hemorrhage were present in the subcutum of the cervical region. The pharyngeal, cervical, and axillary lymph nodes were swollen, moist, and contained large hemorrhages both in the peripheral and central portions. The inguinal and popliteal lymph nodes were likewise affected. The tonsils were brick red, of normal size, but appeared more granular than normal. The lungs seemed slightly heavier than normal and were sprinkled heavily with hemorrhagic areas up to 0.5 cm. in diameter. The mediastinal and bronchial lymph nodes resembled the peripheral nodes. The heart appeared slightly dilated but was not otherwise remarkable except for edema of both atrioventricular valves. The pericardial fat was studded with minute hemorrhages.

The liver was dark red to light red-purple and appeared finely mottled. It was slightly larger than normal, slightly congested, and the lobular pattern was distinct.

The gall bladder was pale gray and completely opaque. It contained a little watery bile which was freely expressible. The wall had a doughy consistency and was approximately 0.4 to 0.6 cm. in thickness. The kidneys appeared normal in size but bulged slightly on the cut surface. The renal and pelvic lymph nodes were swollen and hemorrhagic. Other viscera were not remarkable. The brain was not examined.

A 47-12. Spitz—Male—1½ Years. 2-7-47.—This animal had a severe, acute illness with a temperature of 104.8 F. at the age of 8 months. A diagnosis of tonsillitis was made and an uneventful recovery followed treatment with sulfathiazole. The terminal illness was similar to the earlier bout, according to the owner. The onset was characterized by inappetence and lethargy. Two days later, when a diagnosis of tonsillitis was made by a private practitioner, there was coughing, gagging and vomiting, and a temperature of 105.0 F. No

Presented before the New York City Veterinary Medical Association, Oct. 1, 1947.

Pathologist to the Angell Memorial Animal Hospital, research fellow in pathology, Harvard Medical School; research fellow in pathology, Children's Hospital; Boston, Mass.

history of treatment was obtained. The animal was admitted to Angell Memorial Animal Hospital in *extremis* four days after the onset. The visible mucous membranes were extremely pale and there was chilling of the extremities and a lethargic mental state. The temperature was 101.5 F.

Autopsy.—The nutritional state was excellent. There was definite right-sided dilatation of the heart with a few petechiae on the epicardium and a slight increase in pericardial fluid.

The liver was dull brown-purple and distinctly mottled by yellowish areas from the size of a pin point to 3 mm. in diameter. These were visible on both the capsular and cut surfaces. The gall bladder was pale gray and doughy on palpation. It contained a little nearly colorless, watery bile. The wall was gelatinous and 0.5 to 0.8 cm. in thickness.

The spleen appeared swollen and was metallic, dark gray-purple. The pulp appeared softer than normal. The kidneys contained bright green nodular concretions in both pelves. These were identified as cystine calculi. There was slight scarring of the cortex. The pancreas contained a number of punctate hemorrhages throughout. The serous surface of the stomach showed prominent "paint-brush" hemorrhages. The mucosa was slightly reddened and appeared thicker than normal. The intestine had a granular appearance when viewed from the serous surface. It was further studded with punctate hemorrhages. The mucosa appeared to be swollen and showed numerous petechiae and larger hemorrhages in the submucous tissue. The mesenteric and retroperitoneal lymph nodes were swollen, soft, and deeply reddened throughout.

A 47-15. Cairn Terrier—Male—2 Years. 2-9-47.—The previous history was marked by an attack of distemper with complete recovery at about 1 year of age. The terminal illness had a course of five days. The onset was marked by lassitude, inappetence, and coldlike symptoms. When presented at Angell Memorial Hospital four days after onset the animal was depressed, had a soft, gagging cough, and a temperature of 101.4 F. The tonsils were swollen and reddened and the surrounding tissue

was also reddened. The owner was given a favorable prognosis and the dog was returned home at which time it vomited. It died, unobserved, four hours later. Another dog, in contact, had had similar symptoms one week previously and uneventful recovery had occurred after four days of sulfonamide treatment.

Autopsy.—The dog was well nourished. The coat was excellent. A slight amount of reddish fluid was noted in the thoracic and abdominal cavities. The tonsils appeared much enlarged, reddish pink in color, with a distinctly granular surface. The mucosa of the epiglottis and larynx was markedly injected. The cervical lymph nodes were somewhat swollen and moist. The middle lobe of the right lung showed a mottling with purplish red areas and was firmer than normal over an area of approximately 3 cm. by 5 cm. The right side of the heart was dilated, the left contracted. A few subendocardial hemorrhages were noted in the region of the papillary muscle of the left ventricle. The right atrioventricular valve was edematous. There was a small, yellowish, raised intimal streak, 2 mm. by 1 mm., just distal to the middle aortic leaflet.

The liver appeared firmer than normal and was bright red-purple. The gall bladder was blue-gray and quite opaque. The wall was 0.4 to 0.6 cm. in thickness and jelly-like. No bile was present. The spleen seemed slightly enlarged. The cut surface was moist and showed prominent Malpighian corpuscles. The stomach appeared normal from the serous surface. There were, however, prominent submucous petechiae in the fundic and pyloric regions. There were punctate hemorrhages scattered through the mesenteric fat in the region of the intestine. The serous surface of the gut was mottled by petechiae. The mucosa showed patchy submucous reddening. The lymph nodes in the abdominal cavity were swollen, moist, and redder than normal. The mesenteric nodes were blood-red throughout. The remainder of the autopsy was not remarkable.

A 47-32. Spitz Mongrel—Male—6 Months. 3-15-47.—The animal was alleged to have been sick two days prior to admittance to the hospital with symptoms of anorexia, thirst, vomit-

LEGENDS FOR PLATE I ON OPPOSITE PAGE

Plate I

- | | |
|---|---|
| A) Lymph node (low-power view) showing hemorrhage in peripheral sinus. | E) Liver (high power) showing intranuclear inclusions in cord cells (a), and inclusion in sinusoidal cell nuclei (b). |
| B) Lymph node (higher magnification) with scattering of nuclear particles from karyorrhexis and paucity of cells in follicle. | F) Liver (lower power) with pale areas of central necrosis. |
| C) Lymph node showing erythrocyte-engorged histiocytes. | G) Heart valve with desquamation of endothelium (a), and developing thrombus (b). |
| D) Spleen showing inclusions within endothelium (a) and probably histiocytes (b). | |

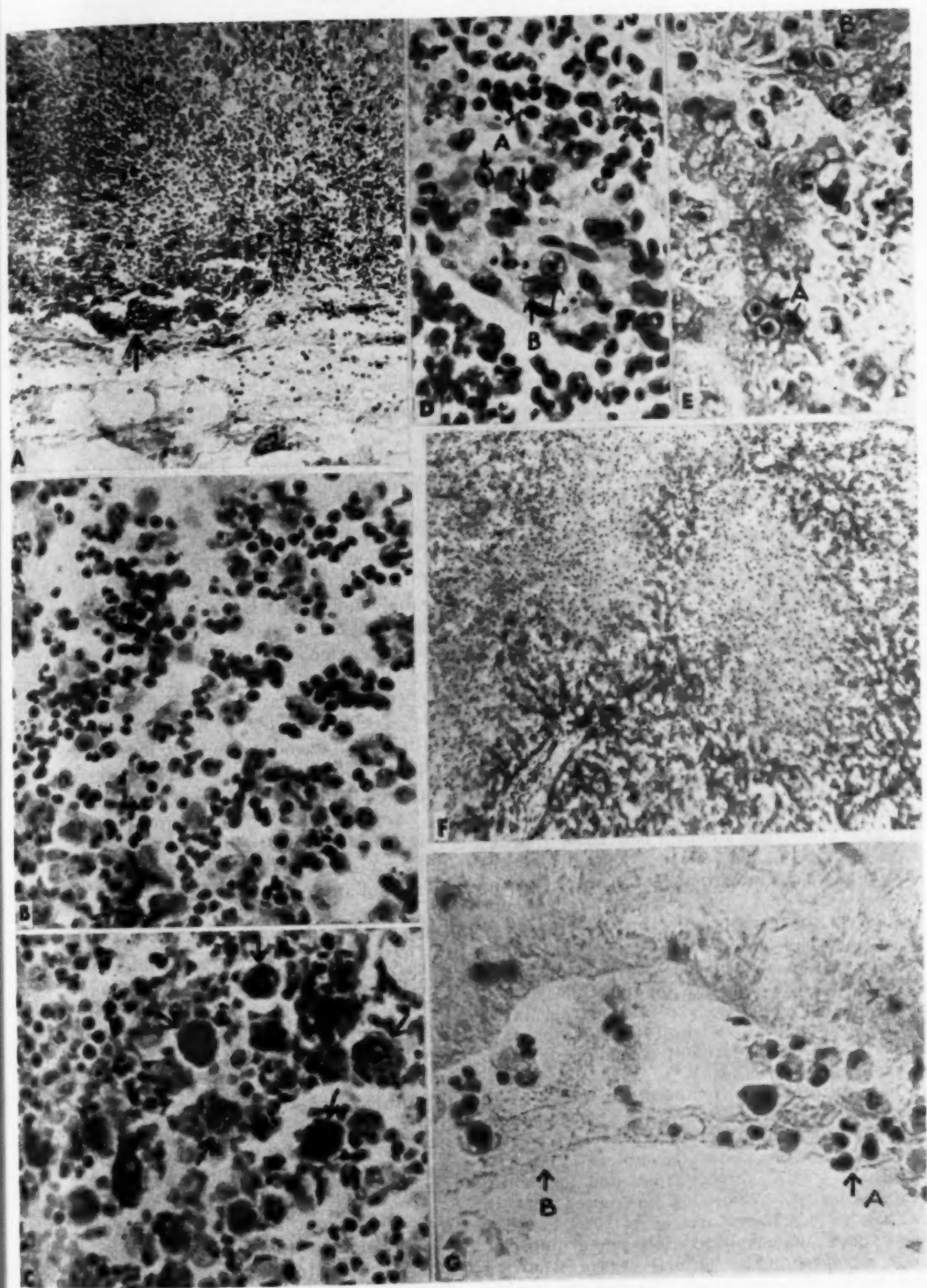


PLATE I

ing, and lassitude. When first seen the temperature was 103.2 F. The animal was extremely depressed, showed marked abdominal tenderness, and vomited blood. Prior to death the next day, diarrhea was noted. At first the stool was mucoid, later becoming frankly bloody. No further record of body temperature is available.

Autopsy.—The examination was performed two days after death. Decomposition was present since no refrigeration was then available. Blood was exuding from the mouth and anus. The conjunctiva was somewhat reddened. The nutritional state was excellent. All the regional lymph nodes were slightly enlarged and highly reddened in the peripheral zone. The swollen tonsils projecting from the crypts, were brick red with a coarsely granular surface. Free blood was seen in the esophagus and trachea. Some blood was present in the pleural cavity. The thymus was swollen, edematous, and studded with bright red ecchymotic spots. The lungs were heavy and appeared congested overall, with large areas of hemorrhage scattered throughout. The bronchi contained a bloody froth. The heart appeared pale and degenerated. (This was possibly the result of autolysis.) There were massive subendocardial hemorrhages in the left ventricle. The aorta showed a raised subintimal plaque just distal to the semilunar valve. The liver was rather light brown and softer than normal. (Autolytic change was evident.) The cut surface contained a few yellowish foci up to 1.5 mm. in size. Lobulation was not distinct. The gall bladder was edematous and the wall was approximately 0.3 cm. in thickness and quite opaque. The spleen and kidneys appeared autolysed. The pancreas showed several hemorrhagic areas. The stomach contained approximately 100 cc. of fluid blood. The mucosa was dark red. The intestine was frankly decomposed.

A 47-119. Dachshund—Male—8 Years. 9-16-47.—This dog had been under treatment by a private practitioner about one week prior to admittance to the hospital for an illness diagnosed as acute upper respiratory tract infection. The temperature was 104.6 F. seven days after the onset. Treatment consisted of sulfathiazole and penicillin.

On admittance, the temperature was 104.4 F. and there was complete apathy accompanied by labored breathing, serous discharge from the conjunctival sacs, and complete anorexia. Treatment with sulfathiazole and penicillin was instituted. Vomiting was noted and in two days the temperature fell to 102.4 F. After eight days of hospitalization some improvement occurred. The animal ceased vomiting and began to eat a little. During this period it developed an ulcer of one cornea. One day before death it suddenly became worse, refused

to eat, showed great prostration and the temperature rose to 104.0 F. It died suddenly following a severe attack of diarrhea.

Autopsy.—The state of nutrition was poor. One corneal ulcer was seen. A slight amount of clear fluid was present in the thoracic cavity. There was marginal consolidation of the middle lobes of the lungs. The pericardial fluid appeared increased. There was right-sided cardiac dilatation. The left atrioventricular valve was swollen and red. The liver appeared large. The lobules were distinct and minute yellowish foci were evident. The gall bladder seemed edematous. The stomach was also edematous. The small intestine showed numerous submucous petechiae. The brain contained numerous subarachnoid petechiae.

HISTOPATHOLOGY (BOSTON CASES)

Microscopic examination of tissues from all of the cases showed that the lesions were essentially similar. They differed more in degree than in type of reaction shown. Therefore, they will be discussed together in the following objective report.

Marked changes were seen in the lymphoid tissue generally, in the endothelial tissue, and in the liver. The changes in the tonsils, lymph nodes, and thymus were almost identical and consisted of edema and congestion usually with hemorrhage into the peripheral, and sometimes the medullary, sinuses (plate 1, fig. A). The lymph follicles appeared somewhat less dense than normal and the centers were marked by severe necrobiotic change consisting mainly of karyorrhexis of the round-cell elements (plate 1, fig. B). Evidence of erythrocyte phagocytosis by the reticulum cells was seen and in certain cases this was most remarkable—the sinuses being packed with red cells and engorged histiocytes (plate 1, fig. C). A few nuclear inclusions were present in the endothelial elements and in the histiocytes. The surrounding tissue was edematous and, in some instances, hemorrhagic. The spleen showed engorgement of the red pulp and an apparent diminution of the lymphocytes in the follicles. Necrobiotic changes, identical to those of the lymph follicles in the lymph nodes, tonsils, and thymus, were also present. These changes consisted of increased nuclear basophilia and fragmentation of the chromatin into segments which then tended to marginate. A few nuclei were pyknotic. Under the low power, the nuclear fragments were evident as dustlike particles scattered throughout the follicle.

Intranuclear inclusions were present in the endothelial cells and histiocytes (plate 1, fig. D).

The liver was mottled under the low power. This was due to clear-cut central lobular necrosis of the hepatic cord cells and also to marked dilatation of the sinusoids. The hepatic cord cells were shrunken and more acidophilic than normal. The sinusoids were dilated by blood or plasma. Necrobiosis, as evidenced by karyorrhexis and pyknosis, occurred in the cells of the sinusoids although the general architecture of the tissue seemed maintained. The liver cord cells showed a rather sharp transition to normal toward the periphery of the lobule. This resulted in the production of a distinctly mottled characteristic of central necrosis under low power (plate 1, fig. F). There were numerous intranuclear inclusions in the cells of the liver cords and sinusoids (plate 1, fig. E).

The unusual thickening of the wall of the gall bladder seen at autopsy proved to be subserous edema on histopathologic inspection. The collagenous fibers and muscle interstices were separated and contained coagulated edema fluid. The mucosa appeared normal.

The kidneys and urinary bladder were normal except for the presence of inclusion bodies in the nuclei of the slightly swollen endothelial cells of the glomeruli and, occasionally, in the smaller veins of both the kidneys and bladder. There were no inclusion bodies in the epithelium of the kidneys, the kidney pelvis, or the urinary bladder.

The lungs showed varying degrees of congestion and edema with evident areas of hemorrhage. Foci of round-cell infiltration

occurred particularly around the perimeter of the smaller bronchi. No inclusions were found in the epithelial cells of the lungs, bronchi, or trachea.

The heart showed myocardial degeneration as evidenced by thinning and separation of the myocardial fibers. One case (A 46-32) showed massive subendocardial hemorrhage. This appeared less evident in the others. However, some evidence of hemorrhage was discernible in all. The most remarkable change in the heart occurred in the valves. The endothelium was swollen and the individual cells were distended with visible, rather basophilic cytoplasm. Many of the nuclei contained inclusions and thus were swollen and broadly oval in outline. There was evidence of endothelial desquamation, detached cells being detected here and there trapped within a developing thrombus (plate 1, fig. G). The interior of the valve leaflet showed fibular separation and granular deposition due to edema fluid.

The stomach was not remarkable except for edema in the mucosa and submucosa. Massive subserous hemorrhage was noted in A 47-32. The intestine in all cases showed evidence of edema and patchy submucous hemorrhage. No inclusion bodies were recognizable in the epithelial cells of either the stomach or intestines although a few could be demonstrated in the endothelium of the blood vessels after prolonged search.

The changes in the adrenals varied from simple lipoid exhaustion in those animals dying after a few days' illness (A 46-6) to evidence of parenchymal necrobiosis and regenerative changes in that animal living

TABLE I

	Germinal layer	Cell	Placement	Stain affinity	Inner-structure
Distemper	Entoderm	Skin, bronchial epithelium,	Cytoplasmic	Acidophilic	Homogeneous
	Ectoderm	bladder, kidney, adrenal medulla, bile ducts, neurons	and intranuclear		or vacuolated
"Acute tonsillitis" and H.C.C.	Entoderm	Liver cord cells, sinusoidal cells, histiocytes, endothelium generally	Intranuclear	Mixed, variable	Homogeneous or particulate
	Mesoderm				
Fox encephalitis	Entoderm	Liver cord cells, sinusoidal cells, histiocytes, endothelium generally plus adrenal cortex	Intranuclear	Mixed, variable	Homogeneous or particulate
	Mesoderm				

longest (A 47-119). No inclusions were noted in the parenchyma.

Due to a complete lack of nervous symptoms, no examination of the central nervous system was attempted in the first 4 cases. As the fifth case did not come to autopsy until after Rubarth's report was published,² examination of the central nervous system of this animal was undertaken to extend the basis for comparison between the Boston and Swedish cases. (This comparison is made under "Discussion.")

Autolytic changes were evident in the neurons of the fifth animal so no evaluation of the finer histologic changes could be attempted. Minor effusions of blood were scattered through the cerebral cortex and were especially evident in the tissue immediately beneath the pia mater. The smaller vessels of the pia-arachnoid showed endothelial swelling, desquamation, and the presence of intranuclear inclusions. The smaller vessels of the cerebrum were similarly affected. In addition, the lumen of the small veins showed some increase in the number of mononuclear blood cells. No change recognizable as perivascular margination of leucocytes or microglial proliferation could be detected.

INCLUSION BODIES

The inclusion bodies presented certain distinctive aspects which showed them to be specific alterations in this disease. Their histogenesis was variable since they occurred in cells derived from the entoderm (the liver cord cells) and cells derived from the mesoderm (the sinusoidal and blood vascular endothelium and histiocytes).

They were purely intranuclear, occupying a central position, growing and gradually displacing the nuclear contents to the periphery of the nucleus. The end result was margination of the chromatin and nucleolus to the periphery and apparent amalgamation with the nuclear membrane.

The internal structure of the inclusion bodies was variable, some appeared amorphous, others particulate. The particles were indefinite and just within the range of visibility, being most evident in Zenker's fixed material stained by eosin methylene blue. The tinctorial properties showed a remarkably wide range varying from bright pinkish red to almost black among the various inclusions, or even in the same body. Certain nuclei contained fine radi-

ating bands extending between the periphery of the inclusions and the nuclear membrane, producing a spidery appearance. (Similar structures have been described by Green¹ for fox encephalitis inclusions.)

DISCUSSION

In view of the emphasis placed upon the tonsils in the clinical examination of these animals, it is well to remember that the tonsillar change is only a part, in fact a minor part, of the entire pathologic picture. The tonsils reflect the generalized lymphoid reaction. Since they are the most easily visualized of all lymphoid structures it is natural and proper that this phase of the disease is emphasized clinically.

Because the symptomatology is imperfectly known, further clinical study, coupled with pathologic confirmation, is required before accurate diagnosis in the living animal can be achieved. However, the study of the Boston cases that were diagnosed as acute tonsillitis, and were of the type of illness usually identified as such, demonstrates that this common syndrome of dogs can be produced by the viral infection described in this paper.

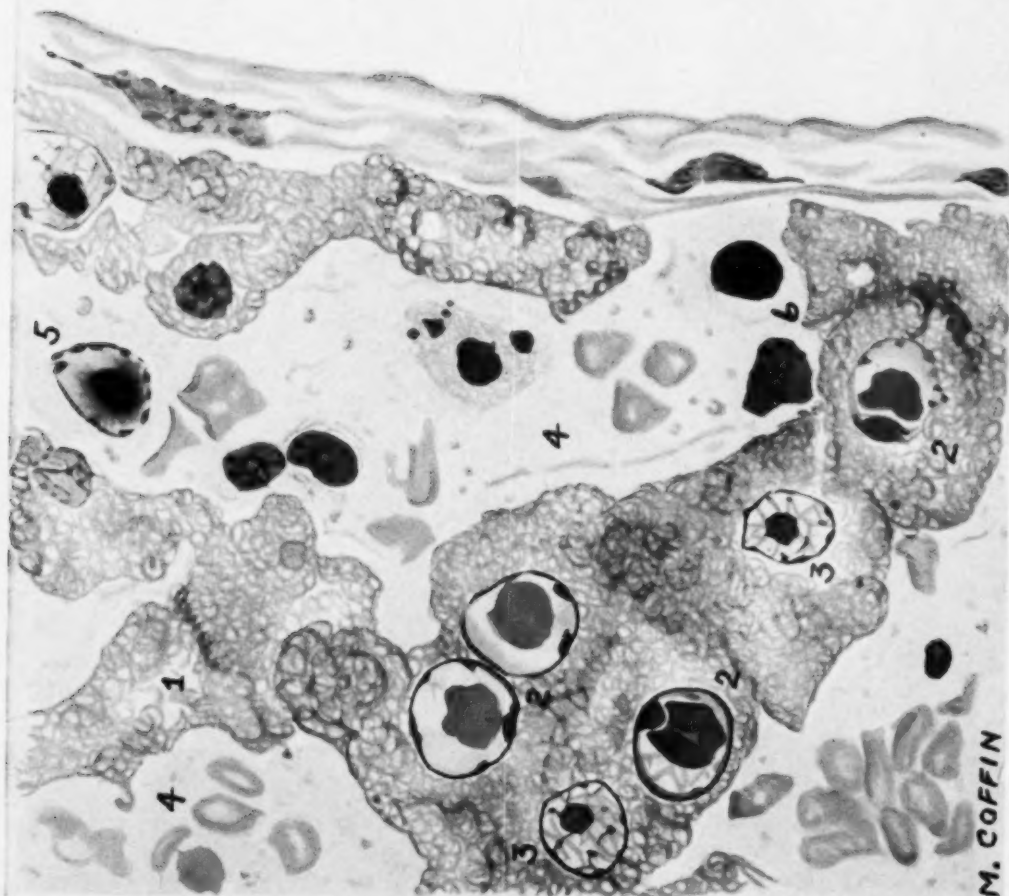
No reference to a natural disease resembling this syndrome could be found in the literature until a copy of a newly published report by Rubarth² in Sweden was received from the author.* (A review of this report will be found in *Veterinary Excerpts*, 7, No. 6, 1947).

The lesions of the disease described by Rubarth as *Hepatitis contagiosa canis* are identical with those occurring in the Boston dogs.

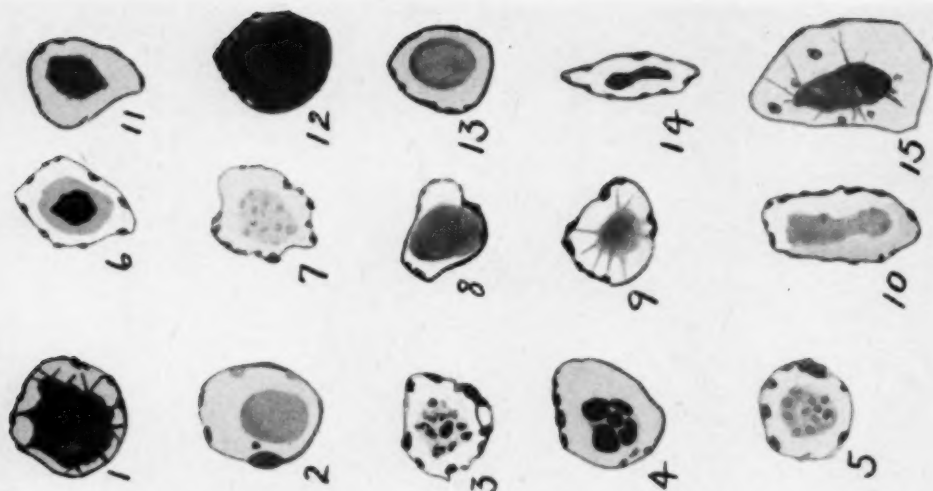
The symptoms reported by Rubarth are more varied as might be expected from the observation of a larger series (190 cases). In addition to the symptoms seen in the Boston dogs, he observed symptoms of central nervous system origin in a fair proportion of his cases. These included complete apathy, sudden violent convulsions, attacks of great agitation, tonic or clonic spasms of the extremities, head, and neck, or paresis in the hind quarters. Certain dogs showed blindness, others local ocular change in the cornea consisting of unilateral central opacity. He, too, has noted the presence of swollen, reddened tonsils in

*Appreciation is expressed to Dr. Fritz Nilsson for receipt of this publication.





A



B

PLATE 2—Camera lucida drawing x 2000.
Legends on opposite page.

many of his animals, leading to a clinical diagnosis of tonsillitis.

In Sweden, experimental transmission from parenteral administration of Berkeley-filtered organ emulsion was accomplished in numerous instances. (This confirms the histopathologic evidence of the viral nature of the disease.) Dog-to-dog cage-contact infection also took place in certain of the Swedish dogs, demonstrating that infection is possible under conditions simulating natural contact exposure.

The epizootiology has been studied in the Swedish investigation by means of the complement-fixation test which showed 70 per cent reaction in a series of 100 blood samples, selected at random from supposedly noninfected dogs. Additional evidence that infection with recovery is possible, in fact rather common, is provided by the knowledge that many animals were resistant to experimental infection, suggesting previously acquired immunity, and that recoveries actually took place in the experimentally produced disease. (These facts tend to corroborate the impression that recoveries take place in our hospital.)

In the Boston cases, as in the Swedish, the lesions of this disease are widespread. Lymphoid reaction, central necrosis of the liver, and endothelial damage occurring in all cases are certainly the paramount changes. With the exception of the inclusion bodies, none of the changes appear specific to this disease alone but merely show strain or damage to the affected organs. However, the lesions mentioned

above in combination with the distinctive inclusion bodies enable ready histopathologic recognition of this disease.

The pathology of the liver suggests that the cause of death may be shocklike collapse due to hepatic deficiency as is the case in Rocky Mountain spotted fever in man. Plasma protein studies and liver-function tests should be utilized to study this phase of the disease so that rational treatment may be developed.

It is interesting to speculate upon the rôle of this disease, assuming that recoveries take place, in producing lymph-node pigmentation, cirrhosis of the liver, and fibrous thickening of the atrioventricular valves seen so frequently during autopsy studies of dogs dying from a variety of causes.

When the Boston cases of tonsillitis were studied histologically, the etiology was attributed to a virus because of the presence of numerous inclusion bodies. The inclusions were found in the tissues derived from the entoderm and the mesoderm. Their characteristics reveal them to be the kind termed type A by Cowdry³ who states: "The nuclear reaction is total and proceeds to complete disintegration. The inclusions are amorphous or particulate but may be condensed into rounded masses. The ground substance of the entire nucleus is disturbed and eventually marginates on the nuclear membrane. . . . They can be regarded as the fingerprints of a special and limited group of viruses which is small in comparison with the hodge-podge of agents to

LEGENDS FOR COLOR PLATE 2 ON OPPOSITE PAGE

Plate 2

A) Actual field from liver section showing: (1) dissolution of liver cord cells with loss of nuclei, (2) swelling of parenchymal cells with presence of intranuclear inclusions, and (3) normal nuclei containing no inclusions. Swollen sinusoidal spaces (4) contain erythrocytes and granular deposition from plasma, and (5) intranuclear inclusion within endothelial cell and (6) pyknotic nuclei. (Giemsa's stain.)

B) Nuclei drawn from cells selected to show various types of inclusions.

1-5) Liver cord cells, Zenker's fixation, e.m.b. (eosin methylene blue) stain: (1) demonstrating spidery projections, (2) amorphous, neutral color, (3) basophilic granulation on acidophilic ground, (4) amalgamating basophilic masses, (5) mixed acidophilic and basophilic granulation.

6-7) Sinusoidal endothelium, Zenker's fixation, e.m.b. stain: (6) strongly basophilic central portion and weakly acidophilic peripheral portion, (7) indefinite, weakly basophilic granulation.

8) Reticulum cell from lymph node. Formalin fixation, Harris hematoxylin and eosin stain. (This cell contained numerous phagocytosed erythrocytes.)

9-10) Spleen—probably reticulum cells. Formalin fixation, Harris hematoxylin and eosin stain: (9) peripheral projections, (10) strongly acidophilic.

11-12) Endothelial cells, heart valve. Zenker's fixation, alum hematoxylin and eosin stain: (11) small, probably early, stage of inclusion, (12) complete development of inclusion and destruction of nucleus.

13) Endothelial cell, kidney glomeruli. Formalin fixation, Harris hematoxylin and eosin.

14-15) Endothelial cells from blood vessels in brain. Zenker's fixation, alum hematoxylin and eosin: (14) cerebral cortex, (15) pia-arachnoid showing pronounced ballooning of nuclei.

which the term *virus* is ordinarily applied."

The histogenesis, plus the character and placement, of these inclusions amply differentiate them from those of canine distemper (Lenz, Green,⁴ etc.). As Rubarth has observed, the lesions of DeMonbreun's⁵ canine distemper type III are identical with those described here. Green⁶ has pointed out the similarity between the DeMonbreun's cases and fox encephalitis. Furthermore, the resemblance of the inclusion bodies seen in the acute tonsillitis of Boston and the *Hepatitis contagiosa canis* in the Swedish dogs, with those described by Green¹ for fox encephalitis, is striking. As Rubarth mentions, the pathology described by Green⁶ in the experimental disease in dogs produced by fox encephalitis virus, plus the placement and character of the inclusions, further indicate a strong resemblance between these diseases and is presumptive evidence of a close relationship of etiology. Confirmatory immunologic studies are needed to prove or refute this relationship.

Table 1 compares the inclusion bodies of distemper, the acute tonsillitis cases or *Hepatitis contagiosa canis*, and fox encephalitis.

There is evidence to support the belief that the disease under discussion is widely spread. In addition to DeMonbreun's description of canine distemper type III, Cowdry and Scott in St. Louis⁷ have described identical liver changes in experimental dogs. Similar lesions have been seen by Ratcliffe⁸ in Philadelphia in dogs used for experimental purposes; and Bloom⁹ on Long Island has noted their occurrence in dogs with a spontaneous disease resembling that seen in Boston. The disease recently reported from Britain as "Infectious Catarrhal Fever of Dogs"¹⁰ may well be the same, since the clinical symptoms are suggestively similar. Further work on the pathology of the British disease may prove the similarity.

SUMMARY AND CONCLUSIONS

1) The pathology of 4 cases of a disease variously called acute tonsillitis, pharyngitis, upper respiratory tract infection, influenza-like infection, etc. is described.

2) One other case apparently similar but characterized by a longer course and having ocular and enteric changes is also described.

3) Histopathologic evidence is presented

that the etiologic agent is a virus of both epitheliotropic and mesotheliotropic properties and completely distinct from the canine distemper virus.

4) The inclusion bodies are described and found to be of the kind termed type A by Cowdry.

5) The disease is compared with *Hepatitis contagiosa canis* of Rubarth and found to be identical.

6) Reference is made to similar disease, termed "canine distemper type III" by DeMonbreun and to similar liver changes seen by Cowdry and Scott in apparently undiseased dogs.

7) A comparison with experimentally produced fox encephalitis in dogs shows a striking similarity and calls for immunologic study to establish the relationship of the viruses.*

*Gratitude is expressed to Dr. S. Burt Wolbach for advice during the course of this study and for assistance in the preparation of the paper.

References

- ¹Green, R. G., Katter, M. S., Shillinger, J. E., and Hanson, K. B.: Epizootic Fox Encephalitis IV. The Intranuclear Inclusions. *Am. J. Hyg.*, **18**, (1933): 462.
- ²Rubarth, S.: An Acute Virus Disease With Liver Lesions in Dogs (*Hepatitis contagiosa canis*). *Acta Pathologica et Microbiologica Scandinavica*, Supplement 69, (1947): 1-222.
- ³Cowdry, E. V.: The Problem of Intranuclear Inclusions in Virus Diseases. *Arch. Path.*, **18**, (1934): 527.
- ⁴Green, R. G., and Evans, C. A.: A Comparative Study of Distemper Inclusions. *Am. J. Hyg.*, **29**, (1939): 73.
- ⁵DeMonbreun, W. A.: The Histopathology of Canine Distemper. *Am. J. Path.*, **13**, (1937): 187.
- ⁶Green, R. G., and Shillinger, J. E.: Epizootic Fox Encephalitis VI. A Description of the Experimental Infection in Dogs. *Am. J. Hyg.*, **19**, (1934): 362.
- ⁷Cowdry, E. V., and Scott, G. H.: A Comparison of Certain Intranuclear Inclusions Found in the Livers of Dogs. . . . *Arch. Path.*, **9**, (1930): 1194.
- ⁸Ratcliffe, H.: Personal communication. (1947).
- ⁹Bloom, F.: Personal communication. (1947).
- ¹⁰Townson, R. S.: Infectious Catarrhal Fever of Dogs. *Vet. Rec.*, **59**, (1947): 203.

Canada Prohibits Hormone Tenderizing of Poultry.—The Canadian food and drug act has been amended to prohibit the use of estrogenic preparations for fattening and tenderizing poultry, because of possible injurious effects on consumers. New regulations prohibit the sale, offer for sale, and display for sale of all hormone products for administration to poultry which may be used as human food. Likewise, the marketing of hormone-treated poultry is also prohibited.—*Can. J. Comp. Med. and Vet. Sci.*, Jan., 1948.

Observation on the Use of Sodium Fluoride as an Ascaricide in Swine

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SINCE the comparatively recent work of Habermann, Enzie, and Foster¹ showed that sodium fluoride in small doses has relatively high efficiency against swine ascarids, their initial findings have been verified and substantiated by a number of workers.²⁻⁷ The dosage recommended in most instances is 1 per cent of the sodium fluoride in the feed for twenty-four hours.

For several years, the pigs maintained at the feeding and breeding station of the Texas Agricultural Experiment Station have been routinely given oil of chenopodium to remove ascarids. The dose usually employed is 1 cc. of the oil for each 25 lb. of body weight, administered in gelatin capsules and followed by a saline purge of magnesium sulfate. After the favorable results reported by various workers concerning the efficacy of sodium fluoride, technical grade, it seemed advisable to test this drug under conditions similar to those existing on many hog breeding farms. We particularly wished to determine the safety of the preparation, its relative efficiency as compared with our routine method of "worming" pigs, and to find if there was any difference in the rate of gain between the pigs receiving oil of chenopodium and those receiving sodium fluoride.

EXPERIMENT 1

In December, 1945, one group of 48 pigs ranging in weight from 24 to 36 lb. were divided into lots of 24 pigs each. Each pen had only 2 pigs for ease of medication and to record more easily any adverse symptoms, should they occur. The 24 pigs in lot 1 ranged in weight from 25 to 32 lb. and their total weight was 671 lb. All pigs in this lot received the routine oil of chenopodium treatment. Ascarids started passing within forty-eight hours and a total of 19 worms was recovered. One pen of 2 pigs contained 8 worms, two pens 4 worms each,

and three pens 1 worm each. Aside from temporary discomfort no toxic symptoms were noted.

Lot 2 consisted of 24 pigs ranging in weight from 24 to 36 lb. with a total weight of 681 lb. They were paired for size and were confined 2 to a pen. Four pounds of dry feed containing 1½ per cent sodium fluoride by weight were placed in each pen. This proved rather unpalatable, for at the end of a 24-hour period an average of only 1 lb. per pen had been consumed. Pigs in one pen had eaten 3 lb., but in four other pens slightly less than ½ lb. was consumed per pen. The unconsumed feed containing 1½ per cent sodium fluoride was removed. Forty-eight hours later, 4 lb. of feed containing 1 per cent, by weight, of sodium fluoride was placed in each pen and was left until consumed. In most instances, the mixture was eaten in twenty-four hours or less. Four worms were recovered. In one pen 2 worms were found and in another 1 worm, following the initial feeding. One worm was found following the second feeding. No evidence of toxicity was observed other than that the feces were

TABLE 1—Administration of Sodium Fluoride in Wet Feed and in Skim milk to Pigs.

	Pigs (No.)	Weight range (lb.)	How fed	Remarks
Stop fed	7	120-600	Individually	Pigs ate readily—no toxicity noted — 35 worms passed.
	5	77-150	Group fed	Pigs ate readily—no toxicity noted — 49 worms passed.
Skim-milk fed	5	74-154	Individually	Pigs disliked it — some vomited—loose feces — 23 worms passed.
	5	90-152	Group fed	Pigs disliked it—all showed diarrhea—16 worms passed.
Total	22			

softer than normal in three pigs. The small number of worms recovered was to be expected since the pigs were maintained under fairly good sanitation.

Starting seven days after treatment, all pigs were self-fed for 104 days. Lot 1, receiving the oil of chenopodium, consumed 11,563 lb. of feed, weighed 4,070 lb., made a total gain of 3,399 lb., and an average daily gain of 1.36 lb. Lot 2, receiving the sodium fluoride, consumed

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Grateful acknowledgement is made to Mr. Otto Seeman, swine herdsman, whose cooperation made these observations possible.

12,145 lb. of feed, weighed 4,230 lb., made a total gain of 3,549 lb., and averaged 1.42 lb. daily gain.

Following the feeding period, 17 pigs from lot 1 and 19 pigs from lot 2 were slaughtered at the college abattoir and the intestines were examined for ascarids. A total of 103 ascarids was recovered from the 17 pigs in lot 1, 1 pig having 30, 4 pigs having 0, and other pigs ranging from 5 to 15 worms. A total of 23 ascarids was recovered from the 19 pigs in lot 2. One pig had 8, 8 pigs had 0, and the remaining pigs ranged from 1 to 3. The majority of the ascarids recovered were adults. The difference in gain is probably not significant but the results would indicate that the pigs receiving sodium fluoride did equally well, or even slightly better, in the feedlot than those receiving the routine treatment of chenopodium, and there were considerably fewer adult ascarids per pig recovered at autopsy.

EXPERIMENT 2

Six months later, in June, 1946, we had the opportunity of again comparing sodium fluoride with oil of chenopodium. Since the animals treated were to be kept for breeding purposes, no records could be obtained other than the observation of worms passed. Sixteen 40-lb. pigs were divided as evenly as possible into two lots of 8 pigs each. The pigs of each lot were penned together.

The pigs in lot 1 received the routine treatment of oil of chenopodium. No toxic symptoms were noted other than temporary nausea. A total of 22 ascarids was recovered from the 8 pigs.

The 8 pigs of lot 2 were given 24 lb. of feed containing 1 per cent sodium fluoride. To assure all pigs receiving their proportionate share and to avoid possible undesirable toxic effects, the feed was divided into 3 portions of 8 lb. each. Following a twelve-hour initial starvation period, the first 8-lb. portion of the feed was given, twelve hours later the second 8 lb. were fed, and twelve hours after the second feeding the third and final portion was given. In this way, the pigs cleaned up each portion before the next was available. No toxic symptoms were noted and 36 worms were recovered from the pen.

EXPERIMENT 3

In an effort to simplify the giving of the medicated feed, to avoid mixing more feed than necessary, and to minimize the danger of undesirable toxic effects to valuable breeding swine, it was more or less arbitrarily decided to add 5 Gm. of sodium fluoride to a pound of feed and allow an animal access to only 1 lb. of feed at a time, regardless of the size of the animal. If the pig was small (25 lb. or less), only 1 lb. was given. Larger pigs were to be given addi-

tional portions twelve to twenty-four hours later. Since no animals were available for autopsy, the effectiveness of the treatment was based on worms passed. On July 22, 1946, 15, 42-lb. pigs were penned in one group and given 15 lb. of feed containing 5 Gm. of sodium fluoride per pound of feed. (A teaspoon, which when level full held 5 Gm. of sodium fluoride,

TABLE 2—Results of Treatment of Pigs with Sodium Fluoride. Each Treatment was Divided into Three Doses Given Twelve Hours Apart; Second Treatment Seven Days After the First.

Pigs per pen (No.)	Treatments		Results	
	First	Second	Asca- recov- Asca- recov-	Asca- recov-
	S. F. with	S. F. with	erid after 1st treat-	erid after 2nd treat-
1	Skim milk	Slop feed	1	2
1	Skim milk	Slop feed	0	18
1	Skim milk	Slop feed	3	88
1	Skim milk	Slop feed	1	28
5	Skim milk	Slop feed	16	67
1	Skim milk	Slop feed	14	3
1	Slop feed	Slop feed	11	0
1	Slop feed	Slop feed	1	0
1	Slop feed	Slop feed	8	0
5	Slop feed	Slop feed	49	0
9	Dry feed	Slop feed	21	2
1	Dry feed	Dry feed	14	4
11	Dry feed	Dry feed	9	0
10	Dry feed	Dry feed	8	0
5	Dry feed	Dry feed	2	1
3	Dry feed	Dry feed	0	2
8	Dry feed	Dry feed	11	0
7	Dry feed	Dry feed	0	0
8	Dry feed	Dry feed	3	0
14	Dry feed	Dry feed	0	0
7	Dry feed	Dry feed	1	0
8	Dry feed	Dry feed	25	2
10	Dry feed	Dry feed	1	0
10	Dry feed	Dry feed	5	0
3	Dry feed	Dry feed	1	0
132 Total				

S. F.=Sodium fluoride.

was used as a measure and this amount allowed for each pound of feed.) These pigs consumed the initial 15 lb. of feed during the day and an additional 15 lb. of medicated feed was fed twenty-four hours later. Worms were first observed on the morning of the third day and continued to pass for forty-eight hours. A total of 52 ascarids were recovered from these 15 pigs. No toxic symptoms were noted.

Next sodium fluoride was given to 4 adult breeding sows. They weighed 256, 354, 301, and 380 lb., respectively. The first 2 sows were penned individually. The second pair were penned together. Medicated feed was prepared by adding 1 level teaspoonful of sodium fluoride to each pound of feed. One pound of the feed was given per sow at twelve-hour intervals until 4 lb. were given. One worm was passed by the 256-lb. sow. All 4 sows showed very loose

feces during the 48-hour period following the last feeding of the chemical. No other symptoms were noted.

EXPERIMENT 4

Following these experiments, sodium fluoride was given to the young pigs in the main herd. Ninety-eight purebred pigs ranging in weight from 45 to 60 lb. were sorted and confined in pens according to size and weight. The number of pigs in any one pen depended on the size of the pigs and the size of the pen, the number varying from 5 to 11. Twelve pens were used. One pound of feed, containing 1 level teaspoonful of sodium fluoride, was allowed per pig and was placed in each pen each morning for three consecutive mornings. No toxic symptoms were noted and a total of 197 ascarids were recovered from the pens.

EXPERIMENT 5

The question arose as to whether sodium fluoride given in slop feed or in skimmilk would have any advantages or disadvantages over the administration in dry feed. Accordingly, slop feed was prepared by mixing 5 Gm. of sodium fluoride with 1 lb. of feed and adding sufficient water to make a thin slop. The skimmilk was medicated by adding 5 Gm. of sodium fluoride to 1 qt. of skimmilk. The treatment in each instance consisted of three feedings at twelve-hour intervals. No feed, other than the medicated feed or skimmilk, was allowed during the treatment. (For results, see table 1.)

To determine if advisable to repeat the treatment and to aid in evaluating the anthelmintic efficiency in pigs that could not be autopsied, several animals were treated twice at comparatively short intervals. Each treatment consisted of 5 Gm. of sodium fluoride at twelve-hour intervals for three times. The treatment was given individually to some pigs; others were group fed. In group-fed pigs, the pigs were penned according to size to insure each animal its proportionate share. (For results, see table 2.)

SUMMARY AND CONCLUSIONS

Report is made of the results of anthelmintic treatment of 335 pigs. Thirty-two received oil of chenopodium and 303 received sodium fluoride. The majority of the animals receiving treatment ranged in weight from 25 to 60 lb., but some adult animals were included in the group receiving sodium fluoride. Since the animals treated were in a purebred herd maintained primarily for breeding and feeding purposes, adequately controlled tests were not possible. However, on the basis of worms removed and subsequent appear-

ances of the animals, sodium fluoride was a satisfactory ascaricide. Rather than allow a pig or group of pigs to eat an unknown quantity of feed containing a known proportion of sodium fluoride, we believe it advisable to give a measured amount of the chemical in a measured amount of dry feed or other carrier. There are several reasons for this preference. There is a marked difference between pigs and groups of pigs in their eagerness to consume feed containing sodium fluoride. Small pigs often eat it reluctantly, older pigs have less objection. To better insure each pig obtaining its respective share and to prevent any 1 pig from getting more than its share, sodium fluoride can be given to pigs in divided doses without unduly affecting its efficacy.

Since a normal, healthy pig will consume an equivalent of about 4 per cent of its body weight in feed each day, 1 lb. of feed containing 1 per cent sodium fluoride is considered sufficient for a pig weighing 25 lb. No pig, regardless of size or condition, is allowed more than 1 lb. of feed at any one time. If the pig is larger than 25 lb., additional feedings may be made at 12- or 24-hour intervals, but not more than a total of 4 lb. of such feed is given to any animal regardless of size. The feed may be fed either dry or with enough water added to make a thin slop. Pigs ordinarily consume the slop within ten to thirty minutes, while they usually require four to seven hours to eat the dry feed. No apparent differences were noted in the efficacy or toxicity of the sodium fluoride whether fed in dry feed or slop. However, the slower consumption of the dry feed makes this the preferred method of administration in group treatments. Limited tests were made with the addition of 5 Gm. of sodium fluoride to 1 qt. of skimmilk. One quart was allowed per pig per feeding. Pigs disliked this feed, often leaving the trough and returning before consuming all the milk. Not only was the sodium fluoride distasteful in milk, but apparently it was considerably more toxic, as evidenced by vomiting and diarrhea. The efficacy of sodium fluoride, as indicated by the number of worms passed, was not as high when fed in skimmilk as when fed in dry feed, or when feed made into a slop by adding water was fed.

Safe treatment of small pigs may be accomplished by feeding 1 lb. of feed to which has been added 5 Gm. of sodium fluoride.

In larger pigs, this dosage may be repeated at twelve-hour intervals. Treated feed may be more palatable if sufficient water is added to make a slop. Slop feeding is not recommended for large groups of pigs.

References

- ¹Habermann, R. T., Enzie, F. D., and Foster, A. O.: Tests with Fluorides, Especially Sodium Fluoride as Anthelmintics for Swine. *Am. J. Vet. Res.*, 6, (1945):131-134.
- ²Enzie, F. D., Habermann, R. T., and Foster, A. O.: A Comparison of Oil of Chenopodium, Phenothiazine, and Sodium Fluoride as Anthelmintics for Swine. *J.A.V.M.A.*, 107, (1945):57-66.
- ³Schwartz, B.: Some Wartime Developments in Livestock Parasite Control. *Proc. U. S. Livestock Sanitary A.*, 49, (1945):73-82.
- ⁴Allen, R. W.: Trials with Sodium Fluoride as an Ascaricide for Swine. *North Am. Vet.*, 26, (1945):661-664.
- ⁵Allen, R. W., and Jones, L. D.: The Efficacy of Sodium Fluoride in Removing Ascarids of Swine. *North Am. Vet.*, 27, (1946):358-360.
- ⁶Morgan, B. B., and Grummer, R. H.: The Efficacy of Sodium Fluoride for Light Infections of Swine Ascarids. *North Am. Vet.*, 28, (1947):669-672.
- ⁷Schwartz, B.: Significant Developments in the Control of Livestock Parasites. *Proc. U. S. Livestock Sanitary A.*, 50, (1946):96-101.

Veterinary Allergy

The editorial on "Allergy in Clinical Veterinary Medicine" (*JOURNAL*, Feb., 1948) is most gratifying.

Interest in veterinary allergic disease is evident in several recent publications on the subject. There are the astonishing reports by Wittich¹, Bray², Weil³, and Weil and Reddin⁴ on the occurrence of natural sensitivity to pollen in dogs and in cattle. Reddin^{5,6} has found an allergic dermatitis in a horse to be caused by the specific action of a combination of two unrelated substances, neither one active by itself.

Long before these, Schroeder⁷ described a clear instance of allergy to cow's milk in a young walrus, and more recently Povar⁸ has reported rectal allergy in dogs, which could be traced with certainty to different foods in the several cases.

The writer of the editorial complains with some justice of the "lack of clear-cut definition of, and distinction between, atopy, anaphylaxis, idiosyncrasy, etc." Some authorities, indeed, state categorically that the ultimate definition of these terms is not practicable at present; certainly it is almost true as the editor remarks that "he who defines allergy writes a book."

Nevertheless, we have already come near enough to the definition of those terms to be able to use them so that readers will know approximately what we are talking

about. Reddin⁹ discussed the classification of allergic diseases in lower animals before the New York Academy of Science in 1947. The study of his report will greatly clarify the question of definitions from the practical point of view of veterinary medicine. Reddin reminds us that all of the forms of human allergic disease are presented in lower animals.—A. F. Coca, M.D., Oradell, N. J.

References

- ¹Wittich, F. W.: Spontaneous Allergy (Atopy) in the Lower Animal. Seasonal Hay Fever (Fall-Type) in a Dog. *J. Allergy*, 12, (1941):247.
- ²Bray, George W.: Recent Advances in Allergy. *J. & A. Churchill Ltd., London*, (1937).
- ³Weil, A. J.: Clinical and Comparative Allergy. *Ann. of Allergy*, 5, (Jan.-Feb., 1947):42.
- ⁴Weil, A. J., and Reddin, L., Jr.: Dermal Sensitivity, Heat-labile and Heat-stable Antibody Against Ragweed in Cattle. *J. Immunol.*, 47, (1943):345.
- ⁵Reddin, L., Jr.: Paper Read at the American College of Allergists, San Francisco (1946).
- ⁶Reddin, L., Jr.: Reaginic Allergy in Cattle. *Am. J. Vet. Res.*, 6, (1945):60.
- ⁷Schroeder, C. R.: Cow's Milk Protein Hypersensitivity in a Walrus. *J.A.V.M.A.*, 83, (1933):810.
- ⁸Povar, R.: Food Allergy in Dogs. *Ann. of Allergy*, 5, (May-June, 1947):224.
- ⁹Reddin, L., Jr.: New York Academy of Science Annals (in press).

Anthrax in Two Circus Tigers

The common belief that animals of the order Carnivora are practically immune to anthrax requires reexamination in view of authentic reports of the infection in captive animals of that order. Anthrax in carnivores of the menageries has been reported in recent years by Verge and Placidi (1934), Goret and Mariette (1938), and Urbain (1940) in *Comptes rendus de la Société de biologie* and, more recently, by Goret, Joubert, and Chabert in *Recueil de Médecine Vétérinaire*. The latter is the report of two cases of anthrax in circus tigers supposed (but not proved) to have been contracted from meat of a freshly butchered cow. Because of the short illness and sudden death, the circus owner thought that the first tiger had been criminally poisoned, but the diagnosis of anthrax was confirmed by microscopy and animal inoculations. The second case, less acutely stricken, was treated with massive doses of penicillin which only held the course stationary for some hours preceding the final state of dejection and coma.

In anthrax of captive carnivores, the authors point out, the typical lesions found postmortem, except those of the blood and spleen, may be absent.

Malignant Meningioma in a Dog

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THE SUBJECT of the frequency of spontaneous intracranial tumors in dogs has been previously discussed by the authors.^{1, 2} While gliomas of various patterns are occasionally observed, meningiomas apparently are rare. We were able to find only 1 such

scopic features and because it offers a possibility of comparison with experimentally induced meningiomas in the dog⁴ and with meningiomas in man.

REPORT OF CASE

The subject was a 12-year-old female Scottish Terrier in good physical condition. The first conspicuous symptom to attract the owner's attention was the holding of the

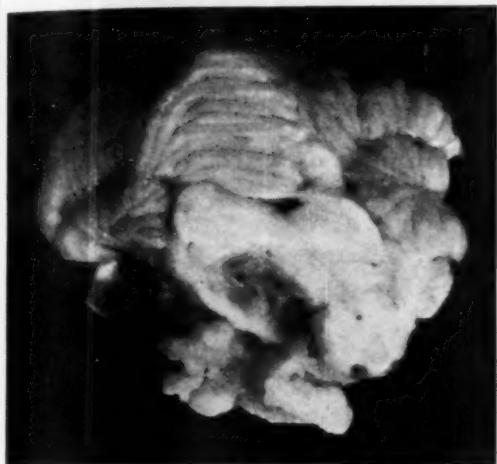


Fig. 1—Gross aspect of neoplasm, showing breakthrough into pons with cyst formation.

case, that by Aring and Mayfield.³ They described a soft purplish tumor, measuring 2 cm. in diameter located at the inferolateral surface of the cerebellum in a 7-year-old Irish Setter. The animal exhibited evidence of a cerebral disturbance for approximately four months, characterized by tendency to stagger to the left, increased tendon reflexes on the left with sustained clonus and nystagmus. The neoplasm was removed surgically but the dog died four days later. The essential microscopic features were: Columns of rounded or oval nuclei of uniform size enclosing considerable chromatin were contained in a generous stroma, mitotic figures were fairly numerous, and an occasional whorl arrangement about small vessels was noted.

The case reported herein is of interest on account of its unusual gross and micro-

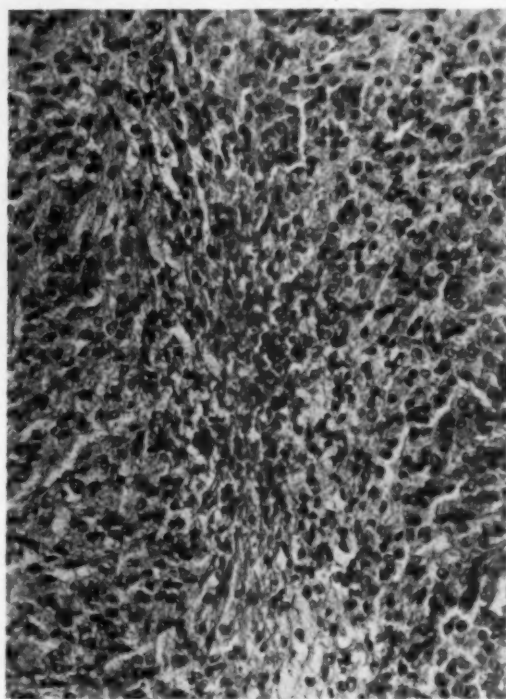


Fig. 2—General microscopic appearance of tumor containing an area with pyknotic nuclei. x 160.

head in a downward position and to the right. The animal was hospitalized for further observation. This was followed within a week by dyspnea, tachycardia, listlessness, and anxiety. About two weeks later the dog began circling to the right almost constantly and occasionally would fall to the right. There was also bilateral dilatation of the pupils. The dog ate and drank fairly well until the circling symptoms appeared. Middle ear infection with possible extension to the brain was sus-

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pected, but could not be confirmed by examination of the right ear canal. Euthanasia was resorted to four days after the onset of the circling symptoms.

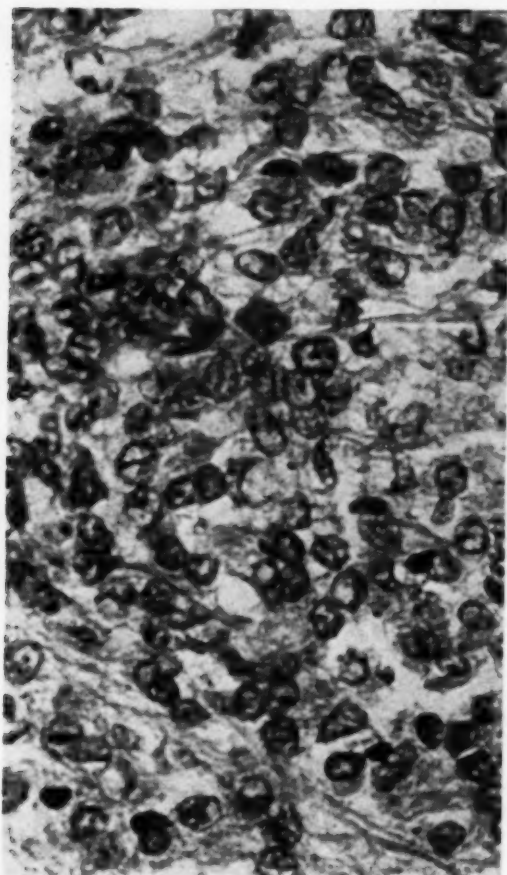


Fig. 3—Tumor cells under higher magnification. x 600.

GROSS DESCRIPTION

The brain showed a neoplasm in extra-cerebral location at the base of the pons which extended into the brain substance proper, where it formed a fairly large cyst (fig. 1). The tumor measured 2 by 1 by 1 cm. and was coarsely lobulated, rather firm and white. The cyst was irregular in shape with a somewhat fringed surface, and measured 7 by 2 by 2 mm. The brain tissue surrounding the cyst was soft and showed a brownish discoloration. No other gross alterations of the brain were observed.

MICROSCOPIC DESCRIPTION

The tumor had a faintly fascicular arrangement. It consisted of cells with medium-sized,

mainly round nuclei that were either evenly distributed or arranged in small clusters. The nuclei were light, with small nucleoli and minute chromatin granules; the nuclear membrane

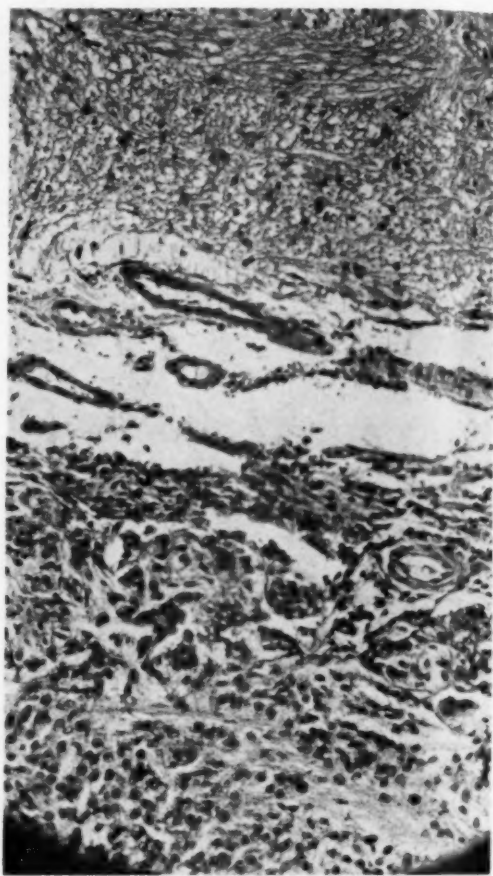


Fig. 4—Meningeal location of tumor tissue, beneath intact brain tissue. x 155.

was distinct and basophilic. A number of somewhat smaller and irregularly shaped, dark nuclei were interspersed, the ratio being about 1:10. As a rule, there were no distinct cells; the nuclei appeared to be contained in a faintly eosinophilic syncytium, occasionally with reticular appearance (figs. 2 and 3). In other fields, indistinct cellular outlines were discernible, and some of the nuclei were more oval-shaped. There were also fields of hyalinosis with absence of cells. Elsewhere, cords of connective tissue were prominent, some of them infiltrated with lymphocytes. The tumor was moderately vascular; in places, closely packed vessels with thickened hyaline walls were noted. Another feature was the presence of minute areas with densely arranged small, dark-staining pyknotic nuclei, many of which were broken into small fragments. The tumor was located in the

meninges (fig. 4) and, as a rule, separated from the brain substance by intact layers of collagenous pial fibers. However, in one field there was a deep break-through into the brain tissue (see gross description) and here, in the pons, a cystic space was formed which was lined by neoplastic tissue with ragged edges and sharp demarcation from the peripheral brain tissue. In this neoplastic zone small hyaline vessels were particularly numerous. In one field of the extracerebral growth, there was a small dumb-bell-shaped, dark blue, apparently calcified area surrounded by hyaline connective tissue and containing a few cells that were indistinguishable from cartilage cells (fig. 5). Other findings included dense perivascular accumulations of tumor cells in the vicinity of the neoplastic cyst and presence of primitive mesenchymal fibrils radiating from many vessels and extending in irregular fashion in the interstices between the neoplastic elements. Mitotic figures in neoplastic cells were infrequent.

DISCUSSION

This tumor was called a malignant meningioma for the following reasons: It apparently originated in the leptomeninges, and the bulk of it showed a definitely extracerebral location. In contrast to the usual benign meningiomas, as observed in man, it was located at the base of the pons and invaded the brain forming a large neoplastic cyst in the adjacent brain substance. The cellular pattern was, to a certain extent, similar to the malignant meningioma produced experimentally by Mulligan *et al.*⁴ (Fig. 10.) It was somewhat different from the pattern commonly seen in malignant meningeal tumors in man (Globus, Levin, and Sheps;⁵ Turner, Craig, and Kernohan⁶), where frequently a greater variety of cells, more mitotic figures, giant cells, whorl formation, perivascular arrangement, and fibrosarcomatous structures are observed. However, the tumor under discussion bears some microscopic similarities to the "parenchymatous type, epithelioid variety" of human malignant meningioma as described by Turner, Craig, and Kernohan.⁶ In addition to the features mentioned before, the presence of mesenchymal framework and of islands of cartilage with calcification appeared to justify the classification of the canine tumor in the meningioma group. Malignant meningiomas with invasive tendencies are infrequent in man (probably less than 10 per cent of all meningiomas⁵). Their frequency in dogs is yet to be determined if and when a larger

number of anatomically verified cases becomes available.

The clinical features in the dog indicated a destructive intracranial lesion although they were not definite enough to allow for a more accurate topic diagnosis. The fairly

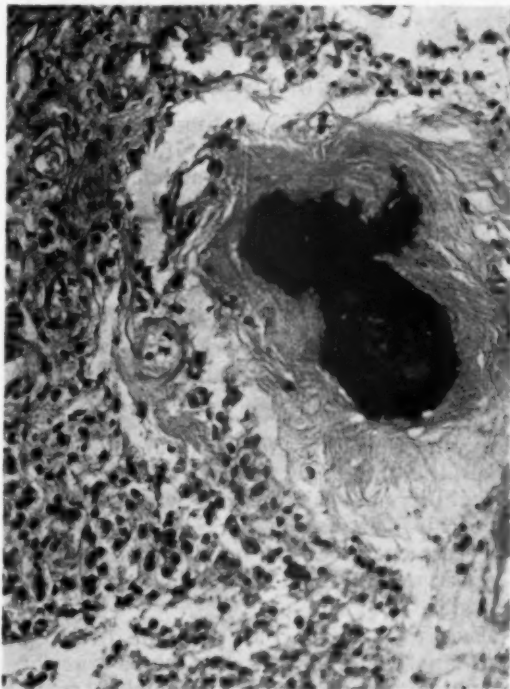


Fig. 5—Calcified cartilaginous area in neoplasm. x 180.

rapid course made it impossible to differentiate between a neoplastic and an encephalitic lesion.

SUMMARY

An unusual extracerebral tumor in a dog, which was thought to be a malignant meningioma, invaded the pons and formed a neoplastic cyst. The clinical features pointed to a destructive intracranial lesion. The microscopic picture was somewhat similar to experimentally produced meningioma in the dog and to malignant meningioma, "parenchymatous type, epithelioid variety" in man.

References

- ¹Davis, C. L., and Neubuerger, K. T.: Oligodendroglioma in a Dog. *J. A. V. M. A.*, 97, (1940): 447-449.
- ²Neubuerger, K. T., and Davis, C. L.: Cerebral Tumor in a Dog Resembling Human Medullablastoma. *Cancer Res.*, 3, (1947): 243-247.
- ³Aring, C. D., and Mayfield, F. H.: Meningioma in a Dog. *Confinia Neurol.*, 2, (1939): 59-63.
- ⁴Mulligan, R. M., Neubuerger, K. T., Lucas, J. T.

Jr., and Lewis, W. B.: Intracranial Neoplasm Produced in Dogs By Methylcholanthrene. *Exptl. Med. and Surg.*, 4, (1946): 7-19.

*Globus, J. H., Levin, S., and Sheps, J. G.: Primary Sarcomatous Meningioma (Primary Sarcoma of the Brain). *J. Neuropath. and Exptl. Neurol.*, 3, (1944): 311-343.

*Turner, O. A., Craig, W. M., and Kernohan, J. W.: Malignant Meningiomas, A Clinical and Pathological Study. *Surg. Gynec. and Obst.*, 11, (1942): 81-100.

Lead Poisoning in Calves

In January, 1948, a 4-month-old registered Holstein-Friesian heifer calf was down and in severe convulsions. Without delay, 20 per cent magnesium sulfate was injected intravenously by gravity flow, even while telling the owner that there was little chance of it doing any good. The calf died before receiving more than 20 cc. of the anesthetic solution, and a search was made to determine the nature and cause of trouble.

The owner had been feeding a saturated calcium gluconate solution to his calves with their milk at every feeding, so the possibility of calcium tic was dismissed. The calf pen was in part bounded by the concrete wall of the barn, against which leaned a big sign lettered on heavy cardboard.

Inquiry brought out that the dead calf and another of about the same age had occupied the pen. When they showed a calflike preference for lying down against the wet concrete, the owner had protected them against chilling by placing the sign against the wall. The story of this sign was rather interesting.

The farm had changed hands twenty-seven years before, and the big sign had been taken down and stored in one of the out-buildings. There it had remained until the present farm owner had retrieved it a week earlier for use in the calf pen. An examination of the sign showed that paint had been licked off and the cardboard even chewed in places.

The owner reported that the dead calf had been colicky at varying times during the day, but it was not until the animal had gone down in convulsions that he became concerned over it. There was no way of knowing how much paint the calf's penmate had consumed, but it had as yet showed no symptoms.

To be on the safe side, the owner was dispensed some 2.5 per cent sodium citrate solution and advised to give it in the calf's

milk at the rate of 8 oz. per day. On two occasions within the next few days, this second calf was colicky and had diarrhea, but it soon recovered and has remained normal.

Comment.—This case shows the long time that lead may remain dangerous in painted objects, and the small amount that is needed to cause serious trouble in calves. It also indicates the possible value of sodium citrate in lead poisoning of calves as already reported for the same trouble in human beings by Kety and Letonoff in 1941.—J. W. Bailey, D.V.M., Ft. Atkinson, Wis.

"Blue Baby" Disease in Dogs

The recent publicity given to the successful surgical closure of Botallo's foramen (foramen ovale) in "blue baby" disease recalls an observation made in adult dogs at the Alfort clinic (*Rec. Méd. Vét.*, Nov., 1947) in which persistence of that fetal orifice was found in connection with enlargements of the spleen and other organic congestions. Obviously, the pronounced cyanosis by which the unclosed foramen declares itself in babies is overlooked in pups. But it manifests the passage of non-aerated blood into the general circulation later in life in the form of passive organic congestions, of which the unaccountable splenomegaly so frequently found in autopsies seems to predominate. An explanation of the difference in the clinical manifestations of a gaping foramen ovale in infants and in pups is its relatively small diameter in the latter as compared with the aortic opening. In other words, the proportion of the blood that does not pass through the lungs is less in pups than in the human infant. There is academic, if not clinical, significance in this newly disclosed fact.

Procaine Penicillin Gives Double Advantage.—A chemical combination of procaine and penicillin G—administered in oil, oil and water emulsion, or physiological saline—gave the double advantage of prolonging therapeutic blood levels of penicillin without inducing local or systemic reactions. This "crystalline penicillin complex" was given to 21 hospitalized patients with gratifying results.—Sullivan et al., *Science*, 107, (Feb. 13, 1948): 169-170.

The Action of Penicillin in Vitro on Organisms Found in Bovine Mastitis

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MASTITIS is the most common and serious disease of dairy cattle. It is estimated that 1 cow out of every 4 in America has mastitis in some degree, and the cost to the United States is from \$50 to \$200 million a year.

IDENTIFICATION OF ORGANISMS FOUND IN MILK FROM COWS WITH MASTITIS

Milk samples from the dairy herd of Kansas State College were taken aseptically after discarding the first two streams. A diagnosis was made by two methods, simultaneously: (1) bacterial examination of incubated milk, and (2) the blood agar plate method.

Micrococci were found in 90 per cent of the milk samples examined. These organisms were identified by the ordinary biochemical reactions and the percentages of various species found were as follows:

<i>Micrococcus epidermidis</i>	20 per cent
<i>Micrococcus varians</i>	13 per cent
<i>Micrococcus caseolyticus</i>	11 per cent
<i>Micrococcus conglomeratus</i>	8 per cent
<i>Micrococcus luteus</i>	7 per cent
<i>Micrococcus candidus</i>	7 per cent
<i>Micrococcus freudenreichii</i>	7 per cent
<i>Micrococcus aurantiacus</i>	7 per cent
<i>Micrococcus flavus</i>	5 per cent
<i>Micrococcus candicans</i>	5 per cent
<i>Micrococcus mucofaciens</i>	5 per cent
Unidentified gram-negative micrococci	5 per cent

Streptococcus agalactiae was distinguished from other streptococci with the aid of the following differential mediums: (1) sodium hippurate, (2) esculin, and (3) litmus milk. Most references mention that *Str. agalactiae* produces four distinct

zones of hemolysis: (1) narrow zone hemolytic colonies; (2) broad zone hemolytic colonies; (3) green hemolytic colonies; and (4) nonhemolytic colonies. In this work, only the first two, i.e., the narrow zone hemolytic colonies and the broad zone hemolytic colonies, were found. Moreover, the latter was not abundant, the majority producing a zone of hemolysis of about 1 mm. in diameter.

Of the 60 strains of streptococci examined, 10 were atypical—not *Str. agalactiae*, *dysgalactia*, or *uberis*; only those strains proved to be *Str. agalactiae* were studied.

In the staphylococcic infection, the organisms were identified by (1) hemolytic action, (2) coagulase reactions, and (3) pigmentation.

THE ACTION OF PENICILLIN IN VITRO ON MASTITIS MILK ORGANISMS

Micrococci.—The sensitivity of these organisms to penicillin was determined by the standard cup-plate method, i.e., agar plates were seeded with these organisms allowing a few cubic centimeters of seeded agar at 45 C. to flow over the surface of the agar plate and draining off the excess. The glass cylinders used in the assay of penicillin were placed on the agar, filled with penicillin, and incubated at 37 C. overnight. At the end of the incubation, zones of inhibition were measured and the sensitivity of these organisms was determined.

The majority of the micrococci were uniform in susceptibility to penicillin and highly sensitive to this drug. Very few showed marked resistance as indicated by the zones of inhibition.

Streptococci.—A 48-hour broth culture was diluted in a series of dilutions (10^{-1} , 10^{-2} , 10^{-3} , 10^{-4} , 10^{-5}).

Commercial powdered sodium penicillin, 100,000 units per bottle, was dissolved in 10 cubic centimeters of sterile saline and kept as a stock solution in the refrigerator.

Abstract of thesis offered as partial fulfillment of the requirements for the Ph.D. degree, Department of Bacteriology, Kansas State College, Manhattan. Contribution No. 235, Department of Bacteriology.

Professor, the School of Veterinary Medicine, Fouad I University, Cairo, Egypt.

Under these conditions it was found that it maintained its strength for four months.

The number of organisms in broth cultures was determined by planting serial dilutions in blood agar plates which were incubated and the number of colonies counted.

It was found advantageous to run rough experiments before proceeding with the final bacteriostatic tests so as to determine the approximate concentration of penicillin that inhibited growth of a given strain. To illustrate, 0.1, 0.01, 0.001, 0.0001 unit penicillin per cubic centimeter were tested on the undiluted broth culture of each

strain; if inhibition was found in the presence of 0.01 and not 0.001 unit penicillin, the final experiment on this strain was run with concentrations of penicillin between these two limits, etc.

In order to vary the concentration of suspended bacterial cells as well as penicillin, each concentration of penicillin lying between the limits set by the preliminary test was added to each concentration of suspended cells. The results are summarized in table 1.

Strains of *Str. agalactiae* were found to differ widely in sensitivity to penicillin. The data from the 50 strains examined may

TABLE 1—Summary of Results of Penicillin on *Streptococcus Agalactiae*

Culture (No.)	No. organisms in 1 cc. undil. broth culture	Conc. of penicillin (unit per cc.) ^a	Undil. broth cultures	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵
1	5x10 ⁷	0.005	+	+	+	0	0	0
4	4x10 ⁷	0.005	+	+	+	+	+	+
5	5x10 ⁷	0.025	+	+	+	0	0	0
7	5x10 ⁷	0.01	+	+	+	+	0	0
9	2x10 ⁷	0.01	+	+	+	+	+	+
10	5x10 ⁷	0.01	+	+	+	0	0	0
11	4x10 ⁷	0.05	+	+	+	+	0	0
12	5x10 ⁷	0.001	+	+	+	+	+	+
13	5x10 ⁷	0.1	+	+	+	+	0	0
14	2x10 ⁷	0.01	+	+	+	0	0	0
15	3x10 ⁷	0.0025	+	+	+	+	+	0
16	5x10 ⁷	0.01	+	+	+	+	0	0
17	3x10 ⁷	0.001	+	+	+	+	+	+
18	5x10 ⁷	0.001	+	+	+	0	0	0
21	5x10 ⁷	0.01	+	+	0	0	0	0
22	4x10 ⁷	0.0025	+	+	+	0	0	0
23	2x10 ⁷	0.001	+	+	0	0	0	0
25	5x10 ⁷	0.01	+	+	0	0	0	0
26	4x10 ⁷	0.001	+	+	+	+	+	+
27	2x10 ⁷	0.025	+	+	+	+	0	0
28	2x10 ⁷	0.001	+	+	0	0	0	0
29	5x10 ⁷	0.01	+	+	+	+	+	+
30	4x10 ⁷	0.01	+	+	0	0	0	0
31	5x10 ⁷	0.025	+	+	+	+	0	0
32	4x10 ⁷	0.025	+	+	+	0	0	0
34	3x10 ⁷	0.01	+	+	+	+	0	0
35	4x10 ⁷	0.01	+	+	+	+	+	+
36	3x10 ⁷	0.01	+	+	+	0	0	0
37	5x10 ⁷	0.05	+	+	+	+	0	0
38	4x10 ⁷	0.01	+	+	+	+	+	+
39	2x10 ⁷	0.01	+	+	0	0	0	0
40	2x10 ⁷	0.001	+	+	+	0	0	0
42	3x10 ⁷	0.01	+	+	+	+	+	+
43	5x10 ⁷	0.025	+	+	+	+	+	+
47	5x10 ⁷	0.0025	+	+	+	+	+	+
49	2x10 ⁷	0.0025	+	+	+	0	0	0
50	5x10 ⁷	0.01	+	+	+	0	0	0
51	2x10 ⁷	0.05	+	+	+	+	+	+
52	5x10 ⁷	0.001	+	+	+	+	0	0
53	2x10 ⁷	0.001	+	+	+	+	0	0
54	2x10 ⁷	0.025	+	+	+	0	0	0
55	3x10 ⁷	0.01	+	+	+	+	+	+
57	2x10 ⁷	0.01	+	+	+	0	0	0
58	4x10 ⁷	0.001	+	+	+	+	0	0
60	2x10 ⁷	0.01	+	+	+	+	+	+
63	3x10 ⁷	0.1	+	+	+	+	+	+
64	2x10 ⁷	0.025	+	+	0	0	0	0
65	2x10 ⁷	0.01	+	+	+	+	+	+

^aConc. of penicillin=The minimum concentration that just inhibited the growth in some or all dilutions of each culture.

be summarized as follows, as regards the minimum concentration that just inhibited growth:

Unit penicillin per cc.	Strain	Per cent
0.1	2	4
0.05	3	6
0.025	7	14
0.01	21	42
0.005	2	4
0.0025	4	8
0.001	11	22

Penicillin acted not only as a bacteriostatic, but also as a bactericidal, agent in concentrations above the minimum concentration necessary for bacteriostasis. The effect of penicillin is influenced to a certain extent by the number of organisms present. Considerable variation of individual cultures to penicillin was recorded, some cultures being 100 times as resistant as others. Variation in resistance among strains could not be associated with any other strain characteristic.

Staphylococcus aureus was isolated from animals with mastitis and the sensitivity

to penicillin determined. The results are shown in table 2.

Staphylococci.—The 35 strains of *Sta. aureus* isolated from mastitis milk were tested for resistance to penicillin in a similar manner to the streptococci. They were found to be more uniformly resistant than *Str. agalactiae*, in that 28 (80%), were just inhibited by 0.01 unit penicillin per cubic centimeter, 4 (11.4%) by 0.05 units per cubic centimeter, and 3 (8.5%) by 0.025 unit per cubic centimeter.

EFFECT OF PENICILLIN ON MORPHOLOGY OF STREPTOCOCCI AND STAPHYLOCOCCI

Gardner¹ found that the morphology of bacteria changes when the organisms are incubated with penicillin. He noticed that staphylococci became enlarged, and that *Clostridium welchii* elongated about ten times its normal length. Even the gram-negative organisms showed variation in morphology, e.g., giant forms were noticed when *Escherichia* was brought in contact with penicillin. Fisher² confirmed these observations.

TABLE 2—The Minimum Concentration of Penicillin that Just Inhibited the Growth in Some or All Dilutions of Each Culture of *Staphylococcus Aureus*

Culture (No.)	No. organisms in 1 cc. undil. broth culture	Conc. of penicillin (unit per cc.)*	Undil. broth cultures					
				10 ¹	10 ²	10 ³	10 ⁴	10 ⁵
1	6x10 ⁷	0.01	+	+	+	+	+	+
2	8x10 ⁷	0.01	+	+	+	+	0	0
3	6x10 ⁷	0.01	+	+	+	0	0	0
4	9x10 ⁷	0.01	+	+	+	0	0	0
5	10x10 ⁷	0.01	+	+	+	0	0	0
6	8x10 ⁷	0.05	+	+	+	+	+	+
7	8x10 ⁷	0.01	+	+	+	+	+	+
8	9x10 ⁷	0.01	+	+	+	+	0	0
9	7x10 ⁷	0.025	+	+	+	+	+	+
10	6x10 ⁷	0.01	+	+	+	+	+	0
11	8x10 ⁷	0.01	+	+	0	0	0	0
12	8x10 ⁷	0.01	+	+	+	+	0	0
13	8x10 ⁷	0.01	+	+	+	+	+	+
14	9x10 ⁷	0.05	+	+	+	+	0	0
15	7x10 ⁷	0.01	+	+	+	+	+	+
16	8x10 ⁷	0.01	+	+	0	0	0	0
17	8x10 ⁷	0.01	+	+	+	+	+	0
18	7x10 ⁷	0.01	+	+	+	+	+	+
19	9x10 ⁷	0.01	+	+	+	+	0	0
20	9x10 ⁷	0.01	+	+	+	+	+	+
21	9x10 ⁷	0.01	+	+	+	+	+	0
22	8x10 ⁷	0.025	+	+	+	+	+	+
23	10x10 ⁷	0.01	+	+	+	0	0	0
24	10x10 ⁷	0.01	+	+	+	+	+	+
25	7x10 ⁷	0.01	+	+	0	0	0	0
26	10x10 ⁷	0.05	+	+	+	+	+	0
27	10x10 ⁷	0.01	+	+	+	+	+	+
28	10x10 ⁷	0.01	+	+	+	+	+	+
29	8x10 ⁷	0.01	+	+	+	+	+	+
30	7x10 ⁷	0.05	+	+	+	+	+	+
31	7x10 ⁷	0.01	+	+	0	0	0	0
32	7x10 ⁷	0.025	+	+	+	+	0	0
33	6x10 ⁷	0.01	+	+	+	+	+	+
34	6x10 ⁷	0.01	+	+	+	0	0	0
35	10x10 ⁷	0.01	+	+	+	+	+	+

In this study, when broth cultures of *Sta. aureus* and *Str. agalactiae* were incubated for five hours at 37 C. in the presence of penicillin and examined microscopically, it was found that *Str. agalactiae* was enlarged to about three times its normal size while *Sta. aureus* was enlarged to twice its original size.

PENICILLINASE

Abraham and Chain¹ found that *Escherichia coli* produced an enzyme which inactivated penicillin and named it penicillinase. Fleming² emphasized the importance of this enzyme as follows: "If penicillinase-producing bacteria are present in sufficient number in a lesion associated with penicillin-sensitive organisms, the latter may be protected by the penicillinase." Moreover, Herrell³ states that penicillin is destroyed in urine which contains *E. coli*.

For these reasons and also the fact that a large percentage of cows' milk contains *E. coli*, efforts were made to detect penicillinase in a number of samples of mastitis milk containing appreciable numbers of *E. coli*.

In 1 case of streptococcal mastitis milk, heavily invaded with *E. coli*, 50 per cent of added penicillin incubated with filtrate of the milk was destroyed in three hours, indicating that the milk probably contained penicillinase. The presence of the penicillinase could not be detected in a number of filtrates of streptococcal mastitis milk showing very little or no growth of *E. coli*.

SUMMARY AND CONCLUSION

Micrococci were found to be present in 90 per cent of the milk samples examined. The majority were uniform in susceptibility to penicillin and highly sensitive. Different strains of *Streptococcus agalactiae* varied significantly in the sensitivity to penicillin. In *Staphylococcus aureus* isolated from the same sources, the strains were much more uniform in sensitivity. Penicillin acted not only bacteriostatically but also as a bactericidal agent in concentrations above the minimum necessary for bacteriostasis.

The variation in sensitivity of these organisms to penicillin may offer an explanation for the frequent failure in the treatment of streptococcal or staphylococcal mastitis with penicillin. It is also possible that unless adequate concentration of peni-

cillin is retained in the udder during treatment it may do more harm than good, due to the development of penicillin fastness by these organisms. In 1 case of streptococcal mastitis milk, heavily contaminated with *Escherichia coli*, 50 per cent of penicillin was destroyed when incubated with the filtrate of that milk for three hours, suggesting the presence of penicillinase, which may also offer an explanation for failure of the treatment of mastitis with penicillin in some instances.

I wish to express my thanks to Dr. L. D. Bushnell, professor of bacteriology, Kansas State College, who supervised this piece of work, for his kind help and advice.

References

- ¹Abraham, E. P., and Chain, R.: Further Observations on Penicillin. *Lancet*, 241, (1941):177-188.
- ²Fisher, A. M.: Action of Penicillin as Shown by its Effect on Bacterial Morphology. *J. Bact.*, 52, (1946):539-554.
- ³Fleming, A.: *Penicillin: Its Practical Application*. Blakiston, Philadelphia, 380 p. 1946.
- ⁴Gardner, A. D.: Morphological Effects of Penicillin on Bacteria. *Nature*, 146, (1940):837-838.
- ⁵Herrell, W. E.: *Penicillin and Other Antibiotic Agents*. W. B. Saunders Co., London, 348 p. 1946.

Paratyphoid Dysentery in Sheep

Salmonella aertrycke, probably a normal resident of the intestinal tract of sheep, becomes virulent and produces paratyphoid dysentery only when animals are fasted or fed irregularly. Long delays and neglectful feeding practices in the shipping of lambs and sheep boomed the incidence of this trouble during war years. That increased effort to stop shipping losses after the war did not obviate this disease was observed by Dr. A. C. Rosenberger, senior field veterinarian of the California state department of agriculture (*California Wool Grower*, Jan. 13, 1948). Apparently, losses are still running high—withstanding that regular and adequate feeding en route ought to have been an almost certain preventive measure.

Corrigenda for Hog Cholera Article in March Journal

The article "Vaccination Against Hog Cholera with Crystal Violet Vaccine by the Intradermic Route" by Mario D'Apice, et al., of Sao Paulo, Brazil, in the March, 1948, JOURNAL (pp. 230-233), had been translated with the authors' permission before it was submitted to the JOURNAL for publication. The following changes, made necessary by faulty translation, unfortunately were not received from the authors until after the March issue was on the press. We are summarizing these corrections and are reprinting corrected tables.

P. 231, col. 2, second paragraph should read:

The syringe employed is of the Record type, with a capacity of 3 to 5 cc. The needle used was 1½ mm. long and 0.5 to 0.6 mm. in diameter. For stiffening, 7 mm. of the base of this needle was mounted in another one 7 mm. long and 0.10 to 0.12 mm. in diameter. Such needles are used for insulin injections in human beings.

P. 232, col. 1, first paragraph should read:

The analysis of table 1 shows that the immunity conferred by vaccine III is *strong*, i.e., all pigs vaccinated with various doses *resisted*. Vaccines I and

II, on the contrary, conferred *weak* immunity against experimental inoculation of virus.

P. 232, col. 1, third paragraph, starting at third sentence, should read:

It *protected* when inoculated into 3 pigs. Unfortunately, we were unable to obtain the same results reported by Cole,¹ who by the intradermic route vaccinated 26 animals and reported . . .

P. 232, col. 2, third paragraph should read:

These results show, in general, that the negative phase of the vaccination period of the vaccines given through the intradermic route is slightly *shorter* than that *observed* in the usual . . .

TABLE 1—Reaction of Pigs to Experimental Infection Following 1-, 2-, and 3-cc. Muscular Injections of the Three Crystal Violet Vaccines

Vaccine I				Vaccine II				Vaccine III			
Dose	No. pigs	Result*		Dose	No. pigs	Result		Dose	No. pigs	Result	
		pro- tected	died†			pro- tected	died			pro- tected	died
1 cc.	3	1	2	1 cc.	3	2	1	1 cc.	3	3	..
2 cc.	3	1	2	2 cc.	3	3	..	2 cc.	3	3	..
3 cc.	3	3	..	3 cc.	3	3	..	3 cc.	3	3	..
Control‡	1	..	1	Control	1	..	1	Control	1	..	1

*The virus (2 cc.) was inoculated twenty-one days after vaccination.

†Dead animals showed signs of hog cholera infection.

‡Control pigs died between ten to thirteen days after virus inoculation.

TABLE 2—Reaction of Pigs to Experimental Infection, Using Different Types of Vaccines by Intradermic Route in a 1-cc. Dose

Vaccine I				Vaccine II				Vaccine III			
Dose	No. pigs	Result*		Dose	No. pigs	Result		Dose	No. pigs	Result	
		pro- tected	died†			pro- tected	died			pro- tected	died
1 cc.	3	3	..	1 cc.	3	3	..	1 cc.	3	3	..
Control‡	1	..	1	Control	1	..	1	Control	1	..	1

*The virus (2 cc.) was inoculated twenty-one days after vaccination.

†All dead pigs showed signs of hog cholera infection.

‡Control pigs died between ten to thirteen days after virus inoculation.

TABLE 3—Test of Negative Vaccination Phase by Intradermic Route, Using Different Types of Vaccines

VACCINE I								VACCINE II							
No. pigs		Result of virus inoculation (days)						No. pigs		Result of virus inoculation (days)					
		5		10		15				5		10		15	
		P	D	P	D	P	D			P	D	P	D	P	D
9		..	3	1	2	3	..	19		..	3	2	1	3	..
Control	3	..	1	..	1	..	1	3	..	1	..	1	1	1	..

Penicillin in Demodectic Mange

Demodectic mange or, perhaps more specifically speaking, staphylo demodectic dermatitis of dogs is reported to respond remarkably well to penicillotherapy,¹ topical and subcutaneous combined. Illustrative is a grave generalized case in a female Poodle 10 months old at the onset, early in January, 1947, with two or three spots of pruritus on the neck the size of a fifty cent piece. By the last of February, the lesions were spreading rapidly, the hair was falling off in bunches, and loss of flesh was pronounced. The lesions, which had receded somewhat in January under classical treatment (astringent powder and sulfonamide injections), had become very grave by the time of the examination. On March 12, there was generalized impetigo, except on the inferior face of the thorax and abdomen; loss of hair over most of the body; elephantine skin and repulsive odor; numerous pustules discharging gray-yellow pus streaked with blood; violent pruritus and deep burrows, especially on each side of the thorax and right side of the jaw; reactionary lymph nodes, some as large as a hazel nut; pale mucous membranes; fair appetite; occasional severe diarrhea; and extreme loss of flesh. The temperature ran around 37.9 C. (100 F.).

The treatment, started March 13, consisted of painstaking local treatment of the scattered pustules, injections of sulfanilamide, cod liver oil, and vitamins C and P. On March 27, there was no improvement. The pustules had augmented at all parts of the body and the lymph nodes were markedly embossed.

A course of penicillin administration was adopted, consisting of five intramuscular injections of 40,000 Oxford units each on March 28, and five more on March 29. On March 30, to the astonishment of the owner, the "weeping" skin had become dry, scabs which detached easily without bleeding were replacing the former lesions, and the pruritus was subsiding. The leg lesions already appeared cured and the lymph nodes were diminishing in size. Because of the owner's illness, the treatment was interrupted until April 15, at which time the skin was supple and in a state of renovation, new hair was growing, the lymph nodes were normal, the appetite was excellent, mucous membranes were rosy, and the diarrhea had ceased. But, on account

of the presence of a number of persistent pustules, the dog was given another 100,000 Oxford units of penicillin the next two days at the rate of 20,000 units per dose. By April 27, the pustules had disappeared, the skin was normally dry, and new hair was growing on all of the formerly affected part of the body. When last seen on May 20, the dog was well, with the exception of a slight thickening of the skin at the level of the neck and about the ears. Microscopic examinations were negative.

The authors report a case described in *Bulletin de la Société Vétérinaire Pratique* in 1946, which responded to penicillin ointment (penicillin 200,000 O.U., lanolin 25 Gm., vaseline 25 Gm.) together with 300,000 units given subcutaneously.

¹Florlo, R., and Gratecos, M.: Demodexose et Penicilline, *Rev. Med. Vet.*, 98, (Dec. 1947): 529-532.

Shifts Lambing Season from Spring to Autumn

T. M. Yeates, capable and ingenious student of the Cambridge (Australia) School of Agriculture (*Sheep Breeder*, Dec., 1947: 74), changed the lambing season of an experimental flock of sheep from March to October by regulating the light of the fold. By means of electric lamps regulated by an automatic clock to prolong the light of day, and blackout materials to regulate the darkness, ewes changed the time of accepting service from the rams in obedience to the simulated season. The experiment was not of makeshift pattern. The light and blackout hours were made to conform precisely to natural conditions by taking bearings of the latitude and longitude of the farm and were regulated exactly from the shortest to the longest day of the year. While the control flock bred in normal fashion, the period of libido of the experimental flock changed as stated above.

Yeates has no illusions as to the practical use of his experiment. He warns sheep breeders against its application, saying: "This is just a piece to fit into our puzzle of what causes life."

Yeast and liver contain a heat-stable factor that alleviates the toxicity of ingested thyroid substances. This factor is not one of the known B vitamins.—*Bethell and others, J. Nutr.*, Oct. 10, 1947.

Report on Streptomycin in Mastitis

Streptomycin has been available for veterinary use for some time, but little information has appeared to date on its indications and doses in mastitis. The following is a brief account of the author's limited experience with that drug.

CASE 1

A purebred Jersey cow was examined and found listless and off feed. Her temperature, pulse, and respirations were normal. Her udder appeared normal and her milk was normal when examined with a bakelite strip cup. A competent herdsman informed me that she had fallen off in milk production sharply and that she appeared normal the previous night. She was treated with 250 cc. of 50 per cent dextrose intravenously.

The following morning her temperature was 103 F., pulse 98, and respirations increased. She refused feed and her right hind quarter was slightly swollen and painful, although the milk was still normal in appearance. A diagnosis of *Escherichia coli* mastitis was made since *E. coli* had been isolated from 2 cases with similar symptoms in that herd about a month previously. Two samples of milk were taken from that quarter for bacteriologic examination, and the quarter was injected with 200,000 units of penicillin and 100 cc. of sulfanilamide in oil.

The bacteriologist at the University of Connecticut confirmed the diagnosis the following morning. The cow's pulse was now 135 and her temperature 104 F. With the owner's consent, 0.5 Gm. (approximately 500,000 units) of streptomycin in saline solution was injected. Twelve hours later, the cow's pulse and temperature were normal and she was chewing her cud for the first time in three days. An additional 0.5 Gm. of streptomycin was injected, and 1.0 Gm. was left to be injected into the affected quarter in four equal doses by the herdsman in four successive days. The cow made a complete recovery and returned to the milking herd.

CASE 2

The second case occurred in the same cow about ten days later. The infection occurred in the right front quarter and was diagnosed by the herdsman as *E. coli* mastitis. The diagnosis was confirmed by the laboratory, and this cow made a complete recovery when streptomycin was injected in 0.25-Gm. doses on four successive days. No pathogens were found in any of this cow's quarters one week after the above treatment was given.

CASE 3

A Guernsey cow which had calved two days previously was treated for an acute case of mastitis with 200,000 units of penicillin. The

affected quarter was hard and swollen, and the cow was dull and off feed. Her temperature was about 105 F., and the secretion from the quarter was scanty and amber colored. The laboratory found hemolytic staphylococci. No improvement was apparent the next morning and 0.5 Gm. of streptomycin was injected. Another 0.5 Gm. of streptomycin was injected on the third visit. No improvement was observed in either the cow or the affected quarter following this treatment. The cow made a very slow recovery and the quarter dried up.

CASE 4

An acute case of *E. coli* mastitis was diagnosed by laboratory methods in a purebred Guernsey cow. One gram of streptomycin was given in three equal doses on successive days. The quarter, which had been very congested and painful, returned to normal rapidly and there was no recurrence.

CASE 5

A Guernsey cow with an acute case of mastitis was treated on two successive days with large doses of penicillin and failed to respond. Laboratory tests on samples of milk taken after treatment was initiated were negative. Two 0.5-Gm. doses of streptomycin were given at 24-hour intervals without improving the cow's condition. Large doses of sulfathiazole sodium given intravenously resulted in a temporary improvement. The cow made a slow recovery.

CASE 6

A Guernsey cow with an acute case of mastitis failed to respond to penicillin and to sulfa drugs. She was off feed and weak and listless. She also failed to respond to two 0.5-Gm. doses of streptomycin. A laboratory test revealed the presence of nonspecific pathogens in the infected quarter. This cow made a slow recovery also.

SUMMARY AND CONCLUSIONS

In all instances where streptomycin was used in cases of *Escherichia coli* mastitis, excellent results were obtained. It appears to be of little value in staphylococcal, nonspecific, or other atypical infections, however. Streptomycin was not tried in streptococcal infections because the literature indicates that it only slightly inhibits gram-positive organisms, while penicillin is highly effective in that field.

Because early and positive diagnoses are essential in cases of acute mastitis, the laboratory findings are a great help. A tentative diagnosis of *E. coli* may be based upon failure to respond to penicillin, symptoms of toxicity, moderately high temperature, and a rapid pulse.

Doses of 0.25 Gm. were found fully effective.

tive in overcoming *E. coli* infections when repeated on three or four successive days. Smaller and fewer doses may prove to be just as effective.—*Arthur Lipman, D.V.M., Putnam, Conn.*

Anthrax in American Bison "Bos Bison L"

Heretofore, there had been no history of anthrax in this zoölogical garden; however, no laboratory diagnosis had ever been attempted and no symptoms had definitely been established in previous deaths among the wild animal exhibits. In the recent outbreak, possibly 3 animals were affected within twenty days. The death of animals 1 and 2 was blamed on subcutaneous hemorrhages due to bruises, and peracute generalized pneumonia, respectively. The third animal which died had definite clinical manifestations of anthrax, especially in the last few hours of life.

Three new buffaloes had been added to the Zoo herd from the Midwest within the last three months. It was from these that the infection was supposedly spread. All the new animals showed a slight cough which, at the time, was diagnosed and treated as shipping fever. When the death of the first 2 occurred that was blamed as the contributing factor.

Symptomatically, all of these animals were weak, blind, and quiet, responding but slightly when touched with a stick. The third buffalo, which was not 1 of the new animals, had been confined for three days because of slight inappetence. During this time, the cough had gradually decreased in violence. Because of a warm spell of weather, the third animal was allowed to run loose in the paddock. It staggered around for about an hour and then collapsed, and died about twenty minutes later.

Postmortem examination showed hemorrhages of all body openings. Subcutaneous bleeding was found in the panniculus when the skin was removed. Body cavities contained serosanguinous fluid; lungs were engorged with blood; the liver was pale, white, and slightly indurated. The external aspect of the kidneys was normal except for blood-stained fat surrounding them; however, the sinus and ureters were solidly clotted with blood. The splenic capsule was thickened; the body of the spleen was en-

larged about 25 per cent of its normal size. On section, it possessed the consistency of soft, black gelatin. The picture looked so much like anthrax that a section of the spleen was taken to a local laboratory to be examined. It proved to be positive.

Due to the publicity created, a thorough program of cleaning up was outlined with the help of the Bureau of Animal Industry. Prior to this outbreak, the carcass had been dragged about 1,000 ft. down a concrete walkway. This walk was thoroughly scrubbed with 2 per cent lye solution. The ropes and canvas used were burned. The 4 remaining animals in the herd were crated and hosed off with warm water to remove mud and dirt from the hair. They were then moved to a quarantine pen.

The shelter sheds and paddock were disinfected in the following manner:

- 1) Concrete and brickwork were scorched with a flame-throwing apparatus.
- 2) All the wood and crates involved were painted, after a thorough scrubbing.
- 3) The metal fence and tree guards were burned with a kerosene weed burner.
- 4) The soil in the corner of the pen in which the animals were fed was muddy and full of litter. This was removed and buried, after first being subjected to a kerosene fire.

Following this, the buffaloes were all vaccinated with a 0.5-cc. anthrax spore vaccine and placed in the original paddock. The quarantine pen was then exposed to the same rigid cleaning as the original.

Several men had been exposed to the disease. These men were watched carefully for local infection. One person whose hand was cut during the autopsy, and later developed slight irritation, was immediately given a penicillin treatment.

The above procedure took three weeks to accomplish. At first glance, some of this may seem superfluous, but in order to do a good job of cleaning up and satisfy the adverse publicity which was aroused, it was deemed necessary. After that time, the zoölogical gardens were again opened to the public.—*David C. McNary, B.S., D.V.M., Pittsburgh, Pa.*

Clinical Pathology.—At the first international congress of the *Société Française de Biologie Clinique*, Paris, November, 1947, the term "clinical pathology" was defined as "the application of pathology and all its related sciences to clinical medicine."

Curable Rabies

The general agreement that rabies is totally incurable wherever it strikes may not always be true. Experimentally inoculated guinea pigs may develop rabies after vaccination and recover, according to a series of trials made by Jacotot and Nouyen-Dine-Lam (*Bull. Acad. Vét., France*, Nov., 1947). In different series of trials, some of the vaccinated guinea pigs resisted the challenge injection of rabies virus, some died, and others contracted rabies and recovered after an illness, of one to four days, characteristically symptomatic of the disease: dejection, inappetence, excitation, and variable degrees of paralysis. Of a group of 15 guinea pigs vaccinated six months previously, 3 died of rabies after the virulent inoculation. The incubation periods were ten, eleven, and seventy-three days and the deaths occurred within two days after the onset. Out of a total of 223 vaccinated guinea pigs used in the trials, 29 manifested symptoms of rabies and recovered, 124 died, and 70 resisted the inoculations.

Rabies in a Steer

Early in November, 1947, a 2-year-old Shorthorn steer was seen after showing rather unusual symptoms. The animal was one of 40 feeders shipped from Kansas some three weeks before. Two days earlier the animal had been observed a half mile from the other steers in the pasture. The steer also pawed the ground and shook its head in an unusual manner. A farm hand tried to approach for a closer view, but was promptly attacked by the seemingly crazy brute. The steer was subject to infrequent attacks that caused it to collapse suddenly as if shot. In a few minutes it would regain its feet, and stand in a depressed attitude for awhile and then paw the ground and shake its head.

The next day the animal was down and unable to rise, but was fully conscious and capable of limited movement. Water had been refused after a sniff or two at the pail, and feed was also of no interest. Salivation was profuse, a thin diarrhea was in evidence, and the general appearance was dull. Breathing was rapid and shallow, with the head being frequently turned in the attitude of milk fever. The outstanding symptom was the frequent, peculiarly hoarse bellow. Having once heard such

bellowing by a rabid cow, rabies was suspected, and no detailed examination was made of the steer.

The owner was advised that the trouble was probably rabies, and warned of the danger to himself and his helpers. It was recommended that the animal be allowed to die a natural death, after which the head could be removed and sent to the state laboratory for positive diagnosis.

Three days later the animal died, and laboratory examination of the brain showed the presence of Negri bodies.

This case was interesting because it was an instance of rabies appearing in a locality where it had never been known before, and was believed to be due to exposure before shipment from Kansas. None of the other steers were similarly affected. This report should serve as a reminder that veterinarians must constantly be on the alert for unheralded appearances of this disease.—J. W. Bailey, D.V.M., Ft. Atkinson, Wis.

Intralingual Antirabic Treatment

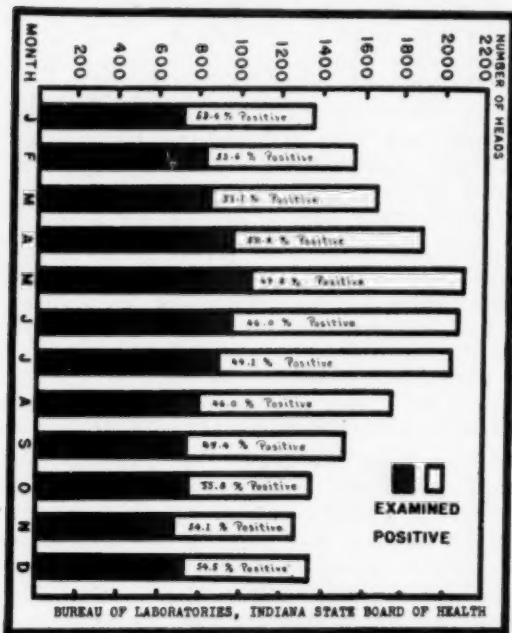
When dogs are treated to prevent the development of rabies after having been bitten by a rabid animal (Pasteur treatment), two or three intralingual injections of the attenuated virus (vaccine) will give more certain results than the usual intramuscular inoculations. The method was reported in *Bulletin de l'Académie Vétérinaire de France* of November, 1947. The method stems from experimental studies of antirabic treatment following intracerebral, intraocular, and intralingual inoculations of fixed rabies virus of dogs and of rabbits. The period of incubation was shorter and more uniform from the intralingual injections. The average was twelve days with extremes of seven and seventeen days as compared with a more variable period following intraocular inoculations.

Based upon these observations, intralingual antirabic vaccination was practiced up to fifteen days following the experimental exposure with the resulting recommendation that the substance of the tongue should be the site of choice for intercepting the development of rabies in dogs bitten by rabid animals. The operation is said to be well tolerated and causes no objectionable inconvenience. The principle involved is racing the vaccine to the nerve centers

ahead of the virus arriving from the site of the bite. A limited number of trials in experimentally inoculated dogs justifies the report.

Rabies in Indiana

The Indiana State Board of Health has collected data on the incidence of rabies in that state. The accompanying bar graph shows the distribution of cases by months from 1914 through 1947. Since the observa-



—Indiana State Board of Health

Graph 1—Total of rabies cases by months in Indiana, 1914-1947.

tions cover each of the intervening years, the bar for January (and each succeeding month) represents the average of thirty-four years' reports.

The curve shows the fluctuation in total number of heads examined and of cases found positive from year to year during the period covered by these data.—R. Fagan, Indianapolis.

[If similar tabulations are available in other states, the JOURNAL will appreciate receiving copies for publication.—Ed.]

P. J. G. Plummer (*Canad. J. Comp. Med.*, Nov., 1947), in an important account of rabies among foxes, wolves, and dogs in three widely separated areas of the Arctic Northwest, holds dogs responsible for creating these faraway reservoirs of rabies virus.

Diagnosis of Rabies by Saliva Inoculation

The inoculation of laboratory mice with penicillin-treated saliva of a rabies suspect may possibly shorten by several days the time required to make a positive diagnosis of rabies. Duffy, Woolley, and Notling¹ describe a case of rabies in a boy of 13 months, whose saliva, taken before his death, was injected into 7 mice of which 4 recovered, 3 died of bacterial infection, and 1 contracted rabies. Negri bodies were found in the brain of some of the mice and the diagnosis in the mice was further confirmed by neutralization tests.

There was no history of exposure to a rabid dog except that a pup, acquired five weeks before the symptoms appeared, acted strangely and disappeared, never to be seen again despite diligent search. The child had suffered from a wound on the upper lip said to have been sustained by falling upon a toy in his crib. The wound was a laceration requiring several sutures.

The physicians, not being permitted to hold an autopsy on the child, employed the saliva experiment in the hope of confirming their diagnosis. The specimens of saliva were treated with penicillin to control bacterial contamination. The diagnosis is reportedly the first one ever made by recovering rabies virus from saliva.

Two things about this case press themselves upon the veterinarian's mind: (1) "Strange" actions of a dog and his vanishing from the scene are major clinical manifestations of rabies, and (2) the use of saliva inoculations as soon as rabies is suspected could often be put to good use.

¹Duffy, C. E., Woolley, P. V., Jr., and Notling, W. S.: Rabies (A Case Report with Notes on the Isolation of the Virus from Saliva.) *J. Pediat.*, 31, (Oct., 1947): 440-447.

Useful though antihistamine drugs may be, they cannot replace treatment—which involves elimination of the substances that produce allergic reactions.

Out of every dollar the farmer takes in (on our national average), 28 cents comes from meat animals, 15 cents from dairy products, 11 cents from poultry. In other words, 54 cents of every dollar the farmer gets is from products safeguarded by the veterinary profession.—*Vitamineral News*.

Sulfamethazine Blood Concentrations in Horses

C. R. SCHROEDER, D.V.M., MARK WELSH, D.V.M., PETER H. LANGER, V.M.D.,
and ROBERT L. BURKHART, V.M.D.

Pearl River, New York

FOR SOME years various sulfonamides have been widely used in the treatment of acute bacterial diseases of domestic animals. Sulfamethazine, the dimethyl derivative of sulfadiazine, has aroused considerable interest recently for several reasons. It has been reported to be the least toxic of the sulfonamides in therapeutic dosage, the most persistent in the blood, and its wide range of action, against both gram-negative and gram-positive organisms, has been shown. In a previous study¹ of the use of seven of the sulfonamides in seven species of domestic animals, the variation in excretion rate of the sulfonamides in each species was shown. The results of this study in horses, which was not concerned with therapeutic blood concentrations but rather with a comparison of the sulfonamides at a fixed dosage, are shown in figure 1.¹ Appreciable sulfamethazine blood concentrations were attained in four hours after administration and persisted through twenty-four hours on a single oral dose of $\frac{1}{2}$ gr./lb. of body weight. It is generally believed that the effectiveness of a sulfonamide is directly dependent upon an adequate blood concentration. The results of investigations indicate that blood concentrations of at least 5 mg./100 cc. are effective in the majority of cases in veterinary practice. The present paper is a report on blood level studies in the horse, with sulfamethazine administered by various routes, at various dosages.

The successful use of various sulfonamides in acute bacterial diseases of horses has been reported frequently.²⁻⁸ The respiratory diseases, influenza, strangles, and pneumonia, or the group usually referred to as "shipping fever," are of primary importance and are reported⁹ to have world-wide distribution. The cause is not definitely known, but it is generally believed^{2, 9-12} that the diseases are initiated

by filterable viruses, while the recognized symptoms and, probably the mortality, are caused by secondary bacterial invaders. Streptococcus, Staphylococcus, and Pasteurella have been isolated most frequently in outbreaks. Rogers,⁸ who was responsible for delivering normal horses at the pier for shipment to Europe by UNRRA, used sulfamethazine in the treatment of these disease conditions in a small number of horses in his charge. A study was initiated on a selected group of horses, which were

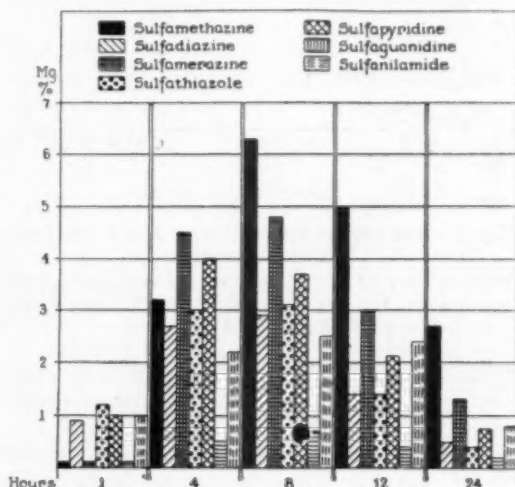


Fig. 1.—Sulfonamide blood levels in horses.
Fate of $\frac{1}{2}$ gr./lb. (71.5 mg./kg.) in a single dose per os.

in poor condition, to compare sulfamethazine with other forms of treatment. During the course of his work, blood cultures were made, and blood concentrations were determined on the horses treated. Other sulfonamides had been used routinely with some success. In Rogers' study of 83 horses treated, 78 made uneventful recoveries, 3 died, and 2 were given other treatment because of failure to improve on sulfamethazine therapy.

Purpura hemorrhagica, bronchitis, or catarrh, sinusitis, rhinitis, and gastroenteritis may complicate or follow the disease conditions in shipping fever. The organisms most commonly associated with

The authors are indebted to Messrs. Harry Mundie and S. C. Griffith, of the Animal Industry Section, for aid in the conduct of the program, and to Mr. S. Senn, of the Analytical Section, Lederle Laboratories Division, American Cyanamid Company, for sulfonamide analyses.

these conditions are streptococci and staphylococci. Joint ill or navel ill, the acute infectious disease of the newborn characterized by purulent inflammation of the joints, kidney abscesses, and general pyemia, is reported⁴ to be responsible for

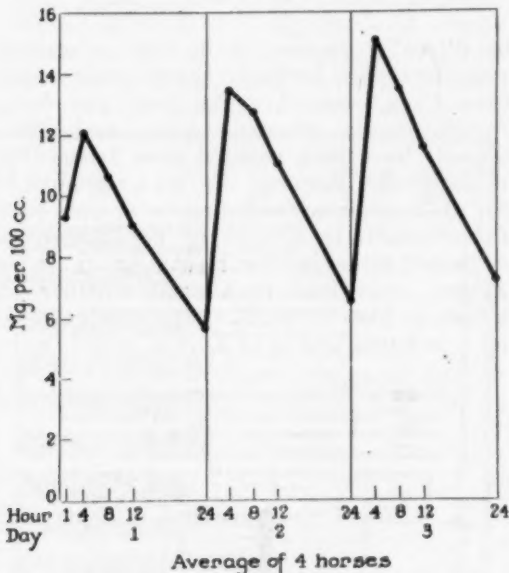


Fig. 2—Free sodium sulfamethazine blood concentrations in horses.

Dose: 1st day—1 gr./lb. body weight subcutaneous administration; 2nd and 3rd day— $\frac{3}{4}$ gr./lb. body weight subcutaneous administration.

high mortality in foals. *Bacterium equirulus*, streptococci, and the colon bacilli have been isolated most frequently.

The activity of sulfamethazine against these various organisms has been summarized by Francis³ on the basis of his own work and that of others.

PROCEDURE

Five experiments were instituted. Two or 4 normal horses or foals were used for each test. All drugs were administered once daily. Sodium sulfamethazine 25 per cent w/v sterile solution was used for parenteral administration. For oral administration, sulfamethazine powder was placed in gelatin capsules. Sulfadiazine and sulfathiazole were used in the same manner. Blood samples were taken at stated intervals and sulfonamide determinations were made according to a modification¹ of the Bratton-Marshall method.¹³

Experiment 1.—Experiment 1 was a comparison of blood concentrations obtained with sulfamethazine, administered subcutaneously and orally for three days, using 4 horses for

each test. The dosage used was 1 gr./lb. of body weight on the first day, and $\frac{3}{4}$ gr./lb. on the second and third days. Blood samples were taken each day at four, eight, twelve, and twenty-four hours.

Experiment 2.—Experiment 2 was a study of blood concentrations of sulfamethazine, using 4 horses. One-half grain per pound of body weight of sulfamethazine was administered intravenously, with simultaneous oral administration of $\frac{1}{2}$ gr./lb. on the first day. A maintenance dose of $\frac{1}{2}$ gr./lb. per os was given for three subsequent days. Blood samples were taken at four, eight, and twenty-four hours on each of the four days of the experiment.

Experiment 3.—Experiment 3 was the same as experiment 2, using a higher dosage. The first dose was simultaneous administration of $\frac{1}{2}$ gr./lb. intravenously, and 1 gr./lb. orally. On the second and subsequent days, only oral administration was used at 1 gr./lb. of body weight.

Experiment 4.—Experiment 4 was a comparative study of blood concentrations obtained with a single dose of sulfamethazine, sulfathiazole, and sulfadiazine, using 2 horses for each drug. The same dosage and routes of administration were used as in experiment 3. Blood samples were taken at one-half, one, one and one-half, four, eight, twelve, and twenty-four hours.

Experiment 5.—Experiment 5 was a study of sulfamethazine blood concentrations in 4 foals.

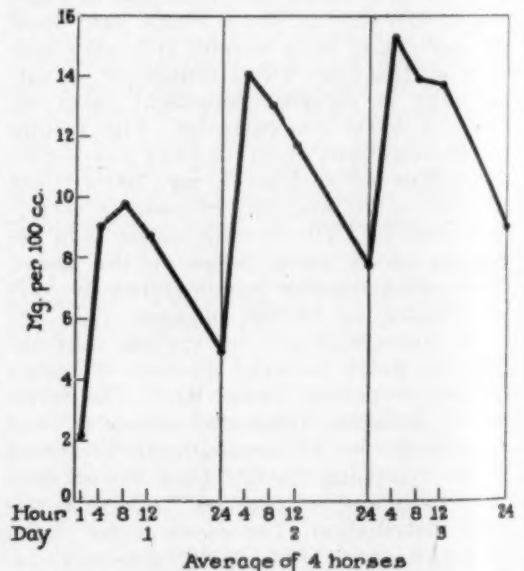


Fig. 3—Free sulfamethazine blood concentrations in horses.

Dose: 1st day—1 gr./lb. body weight oral administration; 2nd and 3rd day— $\frac{3}{4}$ gr./lb. body weight oral administration. Blood samples were taken at definite intervals after dosing.

Since our observations and those of others^{14, 15} indicate that sulfonamides persist longer and have more tendency to accumulate in young animals than in mature animals, a lower dosage was used. The drug was administered subcutaneously at the rate of 1 gr./lb. on the first day, and $\frac{1}{2}$ gr./lb. on the second and third

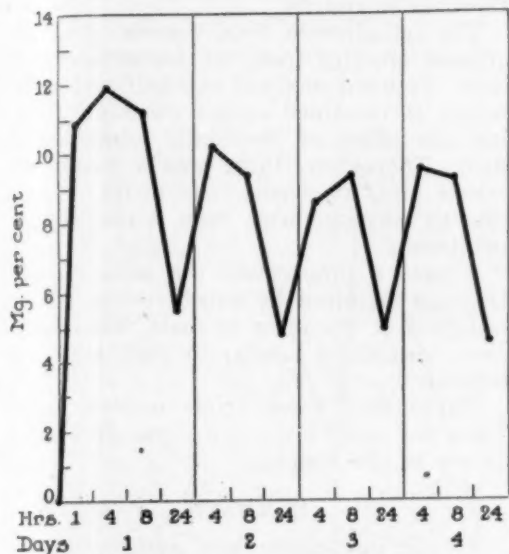


Fig. 4—Sulfamethazine blood levels in horses.

Dose: 1st day $\frac{1}{2}$ gr./lb. body weight, i.v. + $\frac{1}{2}$ gr./lb. body weight, per os; 2nd and subsequent days— $\frac{1}{2}$ gr./lb. body weight, per os.

days. Blood samples were taken each day at one, four, eight, twelve, and twenty-four hours.

DISCUSSION

Figures 2 and 3 show the blood concentrations of sulfamethazine administered subcutaneously and orally. After subcutaneous administration, prompt high blood levels were attained, reaching a peak at about the fourth hour on each day of the test. Effective blood concentrations persisted through twenty-four hours of each day. After oral administration, the levels increased more slowly, reaching a peak at about the eighth hour. On the second and third days, higher levels were attained, and effective levels were maintained throughout the three days of the test.

As the results of these tests indicated that a prompt high blood concentration could be obtained by parenteral administration, and maintained by oral administration, a combination of the two seemed worthy of study. The initial dose should be sufficiently high to saturate tissues, and

subsequent dosage should be high enough to establish a plateau above 5 mg./100 cc. Blood concentrations of sulfamethazine obtained after simultaneous parenteral and oral administration on the first day, and maintained by oral administration on subsequent days, are shown in figures 4 and 5. As might be expected, prompt effective levels were obtained by parenteral administration and maintained by oral administration throughout the four days of the tests. From these studies, it would appear that the dosage of $\frac{1}{2}$ gr./lb. of body weight on the first day, with the maintenance dose of 1 gr./lb. on subsequent days, would be within the therapeutic range. The concentrations obtained with the lower dosage were not sufficiently high to obtain optimum results.

Blood concentrations of sulfamethazine and sulfathiazole are shown in figure 6 and of sulfadiazine in figure 7. One-half hour after administration of the drugs, an almost identical high blood concentration was recorded for the three drugs. At one hour, the sulfamethazine level had in-

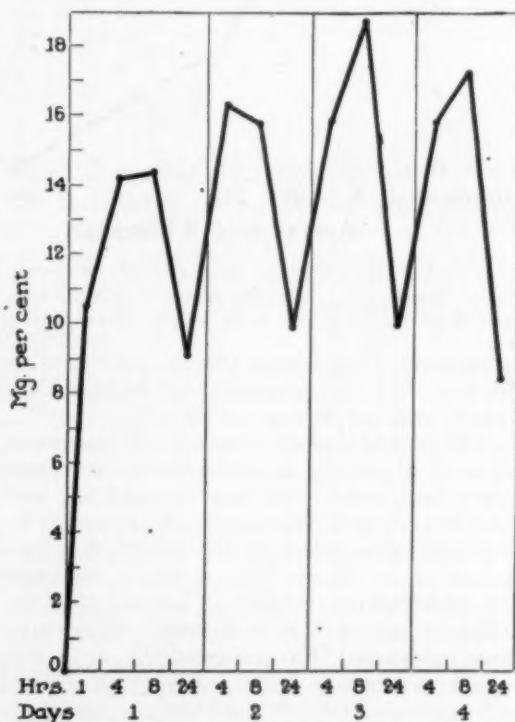


Fig. 5—Sulfamethazine blood levels in horses.

Dose: 1st day— $\frac{1}{2}$ gr./lb. body weight, i.v. + 1 gr./lb. body weight, per os; 2nd and subsequent days—1 gr./lb. body weight, per os.

creased slightly, and, at one and one-half hours showed a sharp increase. There was a steady increase to a peak recording at eight hours, after which there was a steady decrease. However, at twenty-four hours, the sulfamethazine blood concentration was

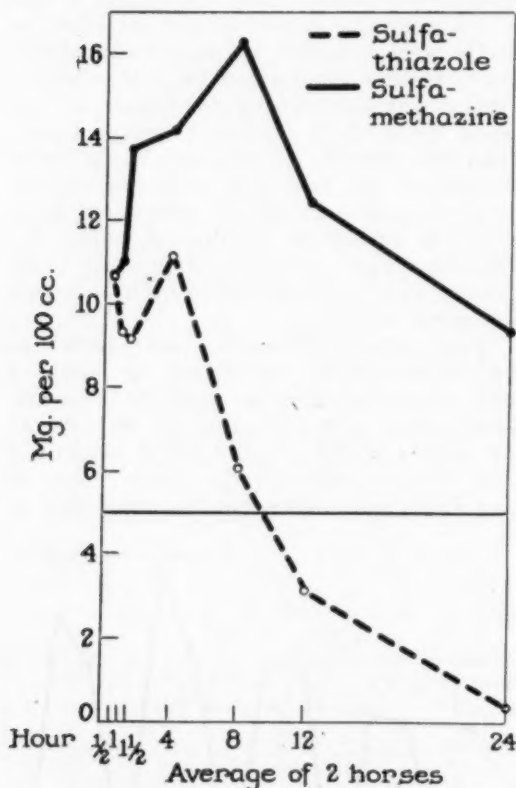


Fig. 6—Sulfonamide blood concentrations in horses. Dose: Simultaneous administration—1 gr./lb. body weight orally; 1/2 gr./lb. body weight intravenously.

approximately 9.5 mg./100 cc., considerably higher than the accepted minimum therapeutic concentration.

The sulfathiazole blood level, however, showed a marked decrease from the immediate high level. Between one and one-half and four hours, there was an increase, indicating absorption of the orally administered drug, followed by a sharp decrease. At eight hours, a level of 6.0 mg./100 cc., slightly above the minimum therapeutic level, persisted. Excretion of the drug was rapid; at twelve hours, there was a level of approximately 3 mg./100 cc. which is ordinarily ineffective against many of the pathogens *in vitro*. At twenty-four hours, practically all drug had disappeared from the blood. It has been shown¹ that sulfa-

thiazole was just as effective as sulfadiazine when the same blood levels were maintained in mice against *Pasteurella multocida* infection. The results of this experiment, however, substantiate earlier findings^{1, 3} that higher and more frequent dosage of sulfathiazole is necessary for therapeutic results.

The sulfadiazine blood concentration decreased slightly from the immediate high level. Between one and one-half and eight hours, it remained almost constant, showing the effect of the orally administered drug. Thereafter, there was a steady decrease and, at twenty-four hours, a level of only slightly more than 2 mg./100 cc. persisted.

Figure 8 summarizes the blood concentrations produced by subcutaneous administration of the drug in foals. The results show absorption similar to that in mature animals.

Throughout these trials neither hematuria nor other untoward signs were noted in any of the animals.

SUMMARY

1) Sulfamethazine was administered to horses, parenterally, orally, and by combinations of the two routes, and parenterally to foals; blood determinations were made at frequent intervals after administration.

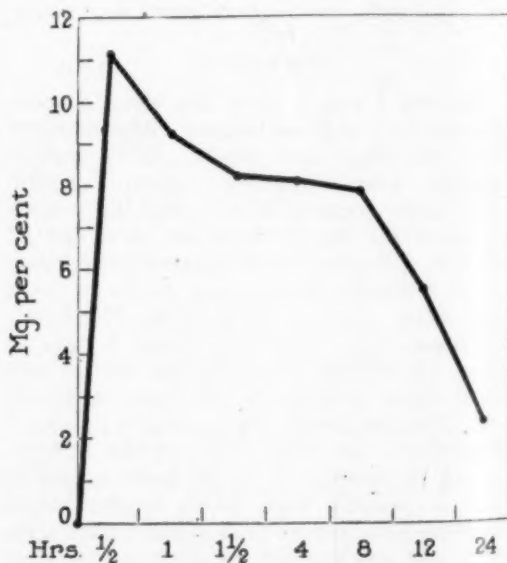


Fig. 7—Sulfadiazine blood levels in horses. Dose: 1/2 gr./lb. body weight, i.v. + 1 gr./lb. body weight, per os.

2) All methods of administration resulted in the attainment of blood concentrations considered to be bacteriostatically effective.

3) From the results of these studies, the dosage of $1\frac{1}{2}$ gr./lb. of body weight

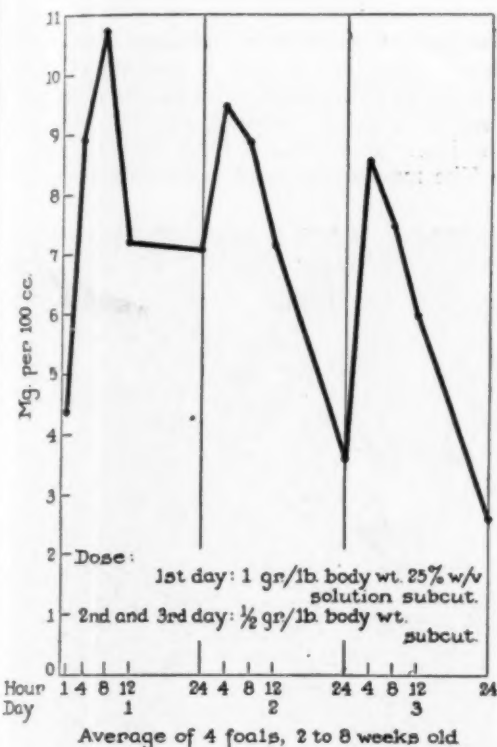


Fig. 8—Sulfamethazine blood concentrations—in foals.

on the first day, and 1 gr./lb. on subsequent days, administered once a day, would be indicated for optimum therapeutic results.

4) No evidences of systemic toxicity of the drug were noted.

5) A comparison of excretion rate, as evidenced by blood concentrations, of sulfamethazine, sulfathiazole, and sulfadiazine, is given. Sulfamethazine persisted well above the minimum therapeutic blood concentration through twenty-four hours, sulfadiazine showed good levels through eight hours, but sulfathiazole was rapidly excreted.

References

- ¹Welsh, M., Schroeder, C. R., Vroman, Della F., Reddin, L., Burkhart, R., and Langer, P.: The Fate of $\frac{1}{2}$ gr./lb. Body Weight of 7 Sulfonamides in 7 Animal Species. Proc. U. S. Livestock Sanitary A., 50th Ann. Meeting, (1946):213.

²Francis, J.: A Review of the Respiratory Diseases

of the Horse. J. Roy. Army Vet. Corps, 14, (Nov., 1942):5.

³Francis, J.: Bacterial Chemotherapy in Veterinary Medicine. Vet. Rec., 59, (March, 1947):131.

⁴Udall, D. H.: The Practice of Veterinary Medicine. Published by the author. Ithaca, N. Y., (1943):434, 448, 484, 488.

⁵Nye, E. L.: Sulfanilamide and Strangles. Vet. Supplement Army Med. Bull., 33, (April, 1939):96.

⁶McIntosh, R. A.: Sulfonamide Therapy. Canad. J. Comp. Med., 8, (July, 1944):183.

⁷Déscazeaux, J., Courtade, R., and Rocq.: Le Paraminophenylsulfamide (1162F) dans la Chimiothérapie des Infections par le Streptocoque Gourmeux. Bull. Acad. Vét. France, 12, (1939):307. Cit. Biol. Abstr., 14, (1940):489.

⁸Rogers, A. C.: The Treatment of Equine Influenza. Vet. Med., 42, (Oct., 1947):363.

⁹Editorial. Respiratory Diseases. Vet. Med., 37, (Dec., 1942):531-541, 543.

¹⁰Kelser, R. A.: A Discussion of the Factors Concerned in the Etiology of Equine Influenza and Contagious Pneumonia. J.A.V.M.A., 63, (May, 1923):162.

¹¹Hagan, W. A.: The Infectious Diseases of Domestic Animals. Comstock Pub. Co., Ithaca, N. Y., (1945):91.

¹²McFadyean, Sir John: Equine Contagious Pneumonia. J. Comp. Path. and Therap., 51, (June, 1938):108.

¹³Bratton, A. C., and Marshall, E. K., Jr.: A New Coupling Component for Sulfanilamide Determination. J. Biol. Chem., 128, (May, 1939):537.

¹⁴Jones, L. Meyer: The Chemotherapy of Calf Pneumonia I. Some Pharmacologic Aspects of Sulfonamide Administration to Normal Calves. Am. J. Vet. Res., 8, (Jan., 1947):1.

¹⁵Jones, L. Meyer: The Chemotherapy of Calf Pneumonia II. The Use of Sulfathiazole, Sulfapyridine, and Sulfadiazine in the Treatment of Calf Pneumonia. Am. J. Vet. Res., 8, (Jan., 1947):14.

Penicillin in Bovine Infectious Keratitis

In the region of Leningrad, Rastegaeva and Prokofieff¹ treated a disease of cattle that closely resembled the infectious keratitis described in America. Most of the 70 cattle treated were in the stage of corneal ulceration.

The penicillin used was diluted with distilled water to a strength of 150 Oxford units per cubic centimeter. Two to 4 drops were placed in the conjunctival sac twice a day. Treated early, two to four treatments were sufficient. Cases with ulceration recovered in one to two weeks. In a few cases of deep destruction of the cornea, the treatment was not successful.

The principal organism isolated was a hemolytic diplococcus, morphologically similar to the pneumococcus. This organism was sensitive to penicillin *in vitro*. *Hemophilus bovis* (Baldwin) was not mentioned.

—R. E. Habel.

¹Rastegaeva, A. M., and Prokofieff, A. P.: Penicillin in Kerato-Conjunctivitis of Cattle (title translated). Veterinariya, 24, (Aug., 1947):26.

Experimentally Developed Telangiectasis and Sawdust Liver Lesions in Rats

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THE REGIONAL incidence of telangiectatic and sawdust livers is highest in the western states, according to the U. S. Livestock Loss Prevention Board. The annual loss due to telangiectasis, sawdust, and abscesses in the liver exceeds \$1,000,000.¹

dilation of previously existing blood vessels.⁴ Sawdust is not a pathologic term but is an expression used by meat inspectors for a small yellowish or gray lesion in the liver, describing a focal necrotic area.

The macroscopic and microscopic appear-

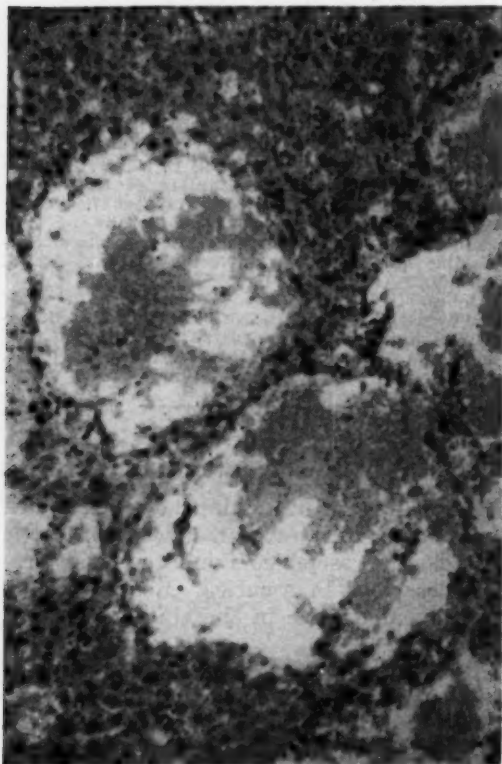


Fig. 1—Distended sinusoids of the liver lined with single layer of endothelial cells. The adjacent hepatic cells are normal in appearance. x 150.



Fig. 2—Transitional phase showing telangiectasis and necrotic (sawdust) areas. x 150.

Many terms have been applied to telangiectasis. Among those which more closely describe the pathologic changes are cavernous angiomas and cavernous angioma.^{2, 3} The term angioma refers to a tumor composed of a network of newly formed capillaries filled with blood. Telangiectasis in the strict pathologic sense refers to the

ance of telangiectasis and sawdust in livers has been investigated by Getty.⁵ He concluded from his studies that the so-called sawdust and telang lesions merely represent different stages of a focal hepatitis. He observed sawdust and telang areas in the livers of 6-month-old calves and emaciated animals. This, according to his observations, discredits the theory that the lesions result from metabolic changes due to nutri-

Approved for publication by the director of the Wyoming Experiment Station, Laramie.

tional disturbances from heavy feeding of animals prior to slaughter. Jensen *et al.*⁶ investigated (1) the time that abscesses develop and (2) the relation of liver abscesses to telangiectasis and sawdust in two feedlot experiments. They reported that liver abscesses developed in the feedlot in from ninety to one hundred and twenty days, and suggest the following pathogene-

sequence of events. However, the causation of the disease up to the present time is unknown.

In investigating the factors which modify chronic selenium poisoning in rats, we observed gross and microscopic lesions in the livers that resembled the lesions described by Getty⁵ and Jensen *et al.*⁶ Therefore, we present some of our experimental

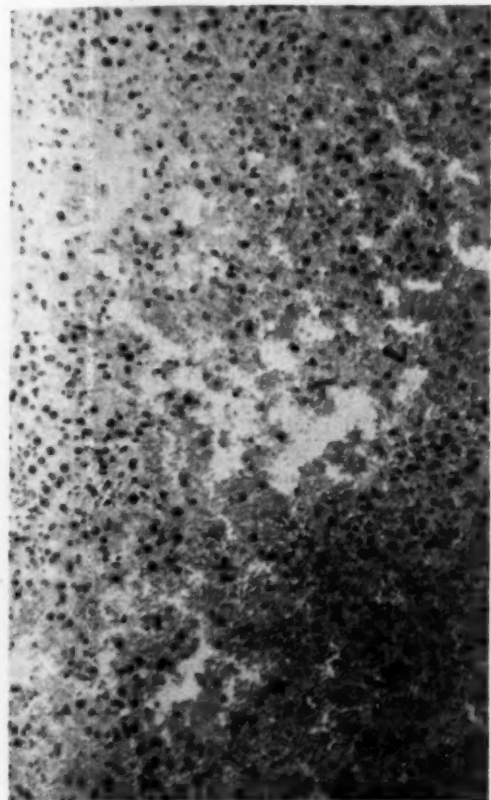


Fig. 3—Sawdust lesion in the liver showing dilation of the sinusoids, hemorrhages, and necrosis. x 150.

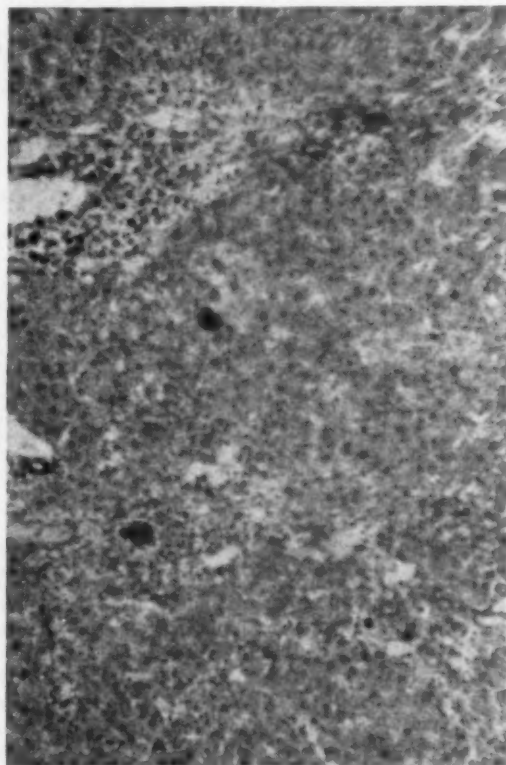


Fig. 4—Cirrhosis of the liver. The connective tissue forms broad bands between the islands of liver cells. x 150.

sis of liver abscesses: (1) cause of telangiectasis unknown; possibly caused by small emboli originating in ulcerative lesions in the mucosa of the alimentary tract; (2) telangiectasis may heal or may transform to sawdust by hemolysis of the erythrocytes and leucocytic infiltration. They also suggest that the dead tissue in the telangiectatic areas may serve as a favorable medium for *Actinomyces necrophorus*, and that the ulcers in the rumen may be the port of entry for the organisms.

As can be seen from these reports, under various conditions liver lesions may develop in cattle, and the disease displays a definite

observations on rat livers. These may throw some light on the causation of liver lesions and perhaps offer some explanation for the high incidence of telangiectatic and sawdust livers in the western states, since most of these states have seleniferous plants. Since the pathologic lesions in chronic selenium poisoning in rats differ in some aspects from those observed in cattle and sheep, we are presenting only those changes, in the liver which, in the rat correspond to telangiectasis and sawdust in cattle.

METHODS

Groups of 10 to 20 Sprague-Dawley adult rats were used for the experiment. The rats re-

ceived 1.5 mg. of selenium as sodium selenate or selenite/kg. of body weight daily until death occurred. In addition to selenium, group 1 received 1 cc. of 2 per cent beet pectin; group 2 received 100 mg. of ascorbic acid; and group 3 received 28 mg. potassium iodide. Group 4 received only selenium and served as the control. The effect of the various added factors on selenium poisoning was reported elsewhere.⁷ The tissues showed considerable variations with the administration of the various agents,

TABLE 1—Incidence of Telangiectasis and Focal Necrosis (Sawdust) in the Various Groups

Substance* given	No. rats autopsied	Remarks
1 cc. of 2% beet pectin/rat/day	2	Telangiectasis with focal necrosis.
	2	Dilation of sinusoids with focal necrosis.
	2	Dilation of sinusoids and hemorrhages.
100 mg. ascorbic acid/rat/day	1	Necrosis and hemorrhages.
	5	Telangiectasis and focal necrosis.
	2	Early cirrhosis.
28 mg. KI/rat/day	5	Telangiectasis and focal necrosis.
	1	Focal hemorrhages.
Control (Selenium only)	5	Telangiectasis and focal necrosis.
	1	Necrosis with cirrhosis.

*In addition to 1.5 mg. of selenium as sodium selenate and selenite/kg. of body weight per day.

but in this paper we discuss only the liver lesions, in relation to telangiectasis and necrosis, which were constant in all groups.

The tissues used for the pathologic study were collected soon after death or from rats which were found in moribund condition and killed. Animals which died during the night and in which postmortem changes may have occurred were not included in the study.

The tissues were fixed in 10 per cent formalin, embedded in paraffin, and stained with hematoxylin and eosin.

RESULTS

Gross Findings.—The livers, grossly showed various hemorrhagic areas which varied in size from pinpoint to 2 to 3 mm. Some areas showed a definite demarcation from the normal parenchyma while in others the blood vessels appeared to be dilated and congested. The cut surface of the demarcated areas appeared spongy and was filled with blood. These areas we considered as hemangioma. There were yellow or gray areas of focal necrosis. These were irregularly scattered within the liver parenchyma and were surrounded by hemor-

rhages. Grossly the lesions appeared to be more like the acute and subacute types of selenium poisoning that we observed in sheep and cattle.⁸ As can be seen from table 1, a few livers showed cirrhosis similar to the pathologic changes observed in alkali disease in cattle.

Microscopic Findings.—The histologic appearance of the dilated gross sections in the livers showed distended sinusoids and vessels which involved one or more hepatic lobules (fig. 1). There was no necrosis nor were there any polymorphonuclear leucocytes present adjacent to the telangiectatic area, indicating that the lesion was not infectious in nature.

Some sections showed areas of transition between telangiectasis and sawdust lesions. These areas showed dilated vessels with areas of focal necrosis (fig. 2). Telangiectatic and necrotic zones were surrounded by acute or chronic inflammatory cells. In some cases, the dilated blood spaces showed early organization and absorption.

Some of the lesions showed various degrees of dilation of the sinusoids intermingled with necrotic (sawdust) lesions. In these zones the necrotic liver cells were surrounded by hemorrhages (fig. 3).

The lesions described were not isolated in a single liver, but were present in almost all the livers, that is, a mixture of telangiectasis and necrosis. A few livers were free of necrosis and showed only dilation of the sinusoids and congestion as can be seen from table 1.

Table 1 also indicates the number of rats which showed early cirrhosis, with newly formed fibrous tissue. The livers in these animals showed organization in the telangiectatic and necrotic areas and proliferation of the fibrocytes. The newly formed fibrous tissue was localized or formed broad bands between the liver parenchyma (fig. 4).

DISCUSSION

The pathologic changes in the majority of the livers of rats with chronic selenium poisoning were different from those observed in cattle with types of selenium poisoning, such as alkali disease and blind staggers. In alkali disease the liver shows cirrhosis; in blind staggers, necrosis, fibrosis, and early cirrhosis are present in the liver.⁸ Our results on rats indicate, in agreement with the observations of other investigators describing the pathology of

chronic selenosis,⁹ that tissue susceptibility to selenium in the rat is variable and not of a very high order. The tissues of cattle are more susceptible to the toxic effect of selenium than the tissues of rats, which would indicate that subtoxic amounts of selenium may produce similar pathologic changes in cattle. When diagnoses of alkali disease or blind staggers are made, the tissues show the same advanced pathologic changes observed in a few of the more selenium-susceptible rats, *i.e.*, necrosis, fibrosis, and cirrhosis.

Smith *et al.*⁹ and Lillie *et al.*¹⁰ observed in rat livers similar sinusoidal and cavernous widening of blood spaces in chronic selenium poisoning. Lillie *et al.* considered this as one phase in the histogenesis of cirrhosis in chronic selenium poisoning.

In our studies on the physiologic action of selenium, we observed that selenite selenium inhibits intestinal motility *in vitro*.¹¹ This indicates that selenium, in addition to its primary protoplasmic toxic action, acts on the smooth muscles. This action on the smooth muscles may be responsible for the vascular atony observed by us and various other investigators. If the action of the toxin is not too severe, or if the tissue is not very susceptible to the toxin, as in the case of the rat, then this phase of changes due to selenium can be observed. If the toxic effect is continued or the dosage is high, diapedesis of the red blood cells or rupture of the wall of the vessels occurs, with subsequent hemorrhages and necrosis, thereby completely omitting the telangiectatic phase. This condition is observed with high dosage of selenium in acute poisoning.

The genesis of the pathologic changes, as we observed in these livers, seems to indicate that telangiectasis occurs first, due to the toxic effect of selenium on the walls of the blood vessels, with or without cellular damage to the parenchyma. As the sinusoids dilate, the oxygen supply to the surrounding cells is reduced and necrosis of the hepatic cells takes place. The necrosis may be due partly to anoxemia and partly to the direct action of selenium on the cells. It is easily seen how in these telangiectatic and necrotic areas abscess formation may take place as suggested by Jensen *et al.*⁶

Our observations were made with selenium, but we cannot exclude other low-grade capillary toxins or bacterial toxins which may initiate these processes under different

environmental conditions. Since a large number of bacterial toxins are endothelial poisons and damage the capillaries, this may account for the relationship of telangiectasis to rumen ulcers.

SUMMARY AND CONCLUSIONS

Pathologic changes in the liver of rats in chronic selenium poisoning differed from those in cattle, due to the lowered tissue susceptibility of rats to selenium.

Rats receiving 1.5 mg. of selenium/kg. of body weight per day showed gross and microscopic pathologic lesions in the livers similar to the telangiectasis and sawdust observed in cattle.

These findings suggest that toxin may be the causative agent of telangiectasis and sawdust livers.

References

- ¹National Live Stock Loss Prevention Board: Meat Wasted in Marketing Livestock, 700 Livestock Exchange Bldg., Union Stock Yards, Chicago, Ill., (1944).
- ²Stockman, S.: Structure and Origin of Cavernous Angiomata in the Livers of Oxen. *J. Comp. Path. and Therap.*, 9, (1896):320-322.
- ³McFadyen, J.: Cavernous Angioma of the Liver of the Ox. *J. Comp. Path. and Therap.*, 3, (1890): 345-346.
- ⁴Boyd, W.: A Text-Book of Pathology. Lea and Febiger, Philadelphia, Pa., (1939).
- ⁵Getty, R.: The Histopathology of a Focal Hepatitis and of its Termination ("Sawdust" and "Telang Liver") in Cattle. *Am. J. Vet. Res.*, 7, (Oct., 1946): 437-449.
- ⁶Jensen, R., Frey, Paul R., Cross, Floyd, and Connell, W. E.: Telangiectasis, "Sawdust" and Abscesses in the Livers of Beef Cattle. *J.A.V.M.A.*, 110, (April, 1947):256-261.
- ⁷Rosenfeld, I., and Beath, O. A.: The Influence of Various Substances on Chronic Selenium Poisoning. *J. Pharmacol. and Exptl. Therap.* In press.
- ⁸Rosenfeld, I., and Beath, O. A.: Pathology of Selenium Poisoning. *U. of Wyo. Exptl. Station Bull.* 275, (1946).
- ⁹Smith, M. I., Stohlman, E. F., and Lillie, R. D.: The Toxicity and Pathology of Selenium. *J. Pharmacol. and Exptl. Therap.*, 60, (1937):449-471.
- ¹⁰Lillie, R. D. and Smith, M. I.: Histogenesis of Hepatic Cirrhosis in Chronic Food Selenosis. *Am. J. Path.*, 16, (1940):223-226.
- ¹¹Rosenfeld, I., and Beath, O. A.: Unpublished results.

Results of Federal-State Brucellosis Program.—Figures released by the U. S. BAI show that 82,989,675 cattle in 6,854,722 herds were tested for brucellosis, in the cooperative federal-state control program, during the period from July 1, 1934, to Dec. 31, 1947. Of the total number of animals tested, 3,604,222 were reactors (4.3%). During the last seven years of this period, 3,339,408 calves were vaccinated. As of Dec. 31, 1947, there were 502 modified accredited counties.

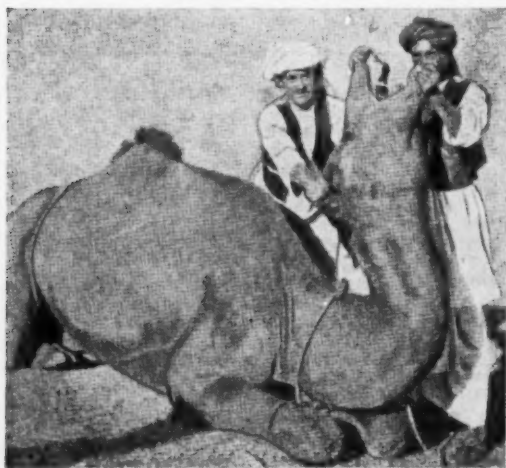
The Camel and Its Diseases (A book review)

General Inspector Curasson of the colonial veterinary service of France, author of large treatises on exotic veterinary medicine, has written the most complete book ever published on the genus *Camelus* spp. The material is backed by long experience in the line of duty in camel-using countries which contain more than half of the world's population.

The context is a critical collection of facts too little known outside of the camel countries of the Old World. Feelingly, the author starts his task with a quotation from a prophet, to wit:

"The welfare of the world until judgment day beams from the forelock of the horse, the sheep is a benefaction, but of animals, the Almighty has created nothing preferable to the camel."

That in a word is the flair of the whole book, whether the title is the Iocene camel of prehistoric North Dakota or the military caravans of World War II. The camel, once the sole means of international travel and freighting, still provides essential transportation for a billion people. The



—After G. Curasson, 1947
Camel secured for drenching.

main area of distribution extends from occidental Africa to the China Sea, but the camels of Abraham and Isaac flourish from the arid climates to the frozen North and at all altitudes are exploited by human beings regardless that they are but "ships of the desert." Unlike the American horse, the camel is not getting itself wiped off the slate.

Besides being written in the style of a best seller, the book is crammed with surprises (to this reviewer). Note:

1) Camels have been known to live one hundred years, although the average span of life is from thirty to fifty years; its work days usually terminate at the age of 20 years.

2) Modern veterinary medicine stems from the indigenous cameliers of the ancients. They are wise, canny, and experienced—far from the rating of empirical charlatans because they know their camels.

3) The native veterinarian or experienced camelier is a good doctor because of a meticulous understanding of *cameline* psychology.

4) There are psycho-physiologic differences between camels and other herbivores, which the novice generally overlooks.

5) In respect to pain and suffering, there is no apparent difference between camels and other large animals but, despite their hard life, bad hygiene, and nutritional deficiencies, their resistance to infections is higher. Epizootics do not spread like those of cattle.

6) Drenching is a major operation requiring special restraint, though drenching of the sick is often needed.

These are a few among many surprises that the author presses into the mind of the reader in his effort to bring camel medicine to a higher level. Obviously, in view of the vast square mileage involved and the large proportion of the world's population served, superficial knowledge of the camel does not conform to the situation. There have been and continue to be many American veterinarians working among camels, hence the liberty taken to announce this classical addition to the literature.—*The Camel and its Diseases* (title translated). By G. Curasson. 464 pages. 83 figures. In French. Vigot Frères, Paris 6, 1947.

Penicillin in Canine Leptospirosis

That penicillin appears to be almost specific in canine *Leptospira canicola* infection is the conclusion of Joshua and Freak (*Vet. Rec.*, 59, Nov. 8, 1947: 595-596) based on 6 cases so treated. In small dogs, an eight-day series of daily injections of 125,000 units (1 cc.) of the drug in oil and wax gave the best results. A large dog (50 lb.) received 1.5 cc. daily for the same period. The benefit to expect from penicillin in this infection depends upon the amount of tissue damage present at the start of treatment. The authors report that treatment should be continued for at least seven days, and preferably eight days, even though there may be apparent recovery before the end of that period.

Shipping Canine Tissues

The prevalence of canine encephalitis has resulted in the shipment of many specimens to laboratories for diagnosis. Because many shipments arrive in such condition that it is impossible to make an adequate diagnosis, Dr. T. T. Chaddock, Fromm Laboratories, Grafton, Wis., has prepared a list of instructions for selecting and shipping tissues to their laboratories. Because laboratory facilities can be used efficiently only if the material is fresh and typical of the condition responsible for death, it is important that the following directions be followed precisely:

- 1) Pack carcass in a metal container.
- 2) Place this container in a box of crushed ice.
- 3) Place box in a large wooden box insulated on all sides, top and bottom with sawdust so that container with carcass is in the center of the package.
- 4) Have legible labels and specify contents of container.
- 5) Supply history of case, symptoms of the disease observed, and any other information of importance.
- 6) Do not ship on weekends or holidays as delay in transit causes decomposition of the carcass.

The receipt of an entire carcass in good condition is most desirable because this provides transmission material and specimens for microscopic examination. *The carcass should not be frozen, but must be preserved while enroute by being maintained at a temperature near freezing.*

In the event that it is impracticable to supply a whole carcass, the following procedure should be followed:

- 1) Open the abdominal and chest cavities and remove a small piece, about the size of a walnut, of the lung, heart, and liver. Remove one kidney, one adrenal gland, half the spleen, and the bladder. Cut out a small piece of intestine and after splitting it, wash the contents out in running water.
- 2) Remove one-half of the brain.
- 3) Place all specimens mentioned in a pint jar of fresh 10% formalin solution.
- 4) Remove the other half of the brain and place in a small jar of 50% glycerin.
- 5) Remove the other half of the spleen, place in a vial and pack in dry ice so that it will arrive in a frozen condition.
- 6) Pack all three containers well to prevent breakage, label fragile, and ship.
- 7) Supply complete case history, symptoms observed, and any other important information.

In order to have sufficient materials to conduct a proper examination, it is imperative that the instructions outlined above be followed explicitly.

Natural Immunity to Foot-and-Mouth Disease

Two weaned bull calves and 3-week-old twin heifer calves were inoculated by multiple puncture of the tongue and gums with virus collected from a field case of foot-and-mouth disease. Both of the bull calves and 1 of the twins developed a severe form of the disease that persisted for one month, but the other twin was unaffected. Throughout this time, the second twin was in constant association with the affected animals. Moreover, after the initial inoculation, repeated attempts were made to infect her by introducing saliva into her mouth from the sick calves, but she withstood infection and remained healthy.—*Shay, Refuah Vet. (Palestine), Nov., 1947.*

Bruise Loss High in Hogs

Figures compiled by Wilson and Co. over an eighteen-month period showed that the average bruise loss per hog slaughtered under federal inspection was 19 cents. Bruises were found on portions of 39 per cent of all hog carcasses during this period, with highest incidence in the hams and fat backs. Over 40 per cent resulted from the use of canes, whips, and clubs and about 37 per cent were caused by prodding, crowding, and trampling.—*From the Kansas Stockman, Jan., 1948.*

Chlordane, a Promising Insecticide

Chlordane, a contact insecticide, is at least seven times as lethal as DDT for flies (*Food Indust. Feb., 1948*). It is also reported to be superior to DDT "and other new toxicants" for controlling common insect pests found in food-processing plants, such as cockroaches and several species of beetles and ants. If used in the low concentrations recommended, it is not more toxic to warm-blooded animals than equally effective DDT preparations, and may possibly be less toxic. Evidence thus far accumulated suggests that it is apparently not dangerous to human beings, provided it is used with the precautions advocated by the manufacturer. Inhalation of chlordane spray should be avoided. Body contact with the chemical may cause dermatitis.

Current comment in veterinary circles indicates that the product may have wide application against several troublesome parasites of small and large animals.

NUTRITION

Reduce Pig Losses by Better Nutrition and Management Report of Committee

This is the report of the Committee on Management and Nutrition resulting from the conference on losses in baby pigs, which was sponsored jointly by the American Feed Manufacturers' Association and the AYMA. (See also report of Committee on Diseases and Ailments in Suckling Pigs, p. 349.)

1) Use good sanitation practices to prevent worm infestation and filth-borne diseases in young pigs. Clean sows, clean farrowing pens, clean yards and pastures, from the standpoint of disease and internal parasites, are most important.

2) Keep sows, gilts, and pigs free from lice and other external parasites to promote better health of the animals and prevent spread of disease.

3) Make maximum use of good green pasture for sows and gilts during pregestation, gestation, and lactation periods whenever possible.

4) Use at least 10 to 15 per cent of high-quality alfalfa meal or ground green leafy alfalfa hay in pregestation and gestation and lactation rations whenever green pasture is not available.

5) Include oats, wheat middlings, or similar feeds with corn and supplements in the gestation and lactation rations of sows and gilts.

6) Consistently use adequate amounts of properly balanced protein, vitamin, and mineral supplements in rations of bred sows and gilts— $\frac{1}{2}$ lb. or more per sow daily, the amount depending on the protein content of the supplement, the age of the sow, and the amount of alfalfa meal or pasture used. Follow directions carefully when using manufactured feeds.

7) Always give bred or lactating sows and young pigs free access to salt. Use stabilized iodized salt if stabilized iodine is not included in the mixed ration or supplement.

8) Give sows and pigs free access to a good mineral mixture if supplementary minerals, especially calcium, phosphorus, and salt, are not otherwise adequately supplied in the ration.

9) Permit bred sows to have free range of pastures and harvested crop fields during winter gestation whenever possible.

10) Avoid abrupt changes in the ration of sows before farrowing. When sows are penned for farrowing, reduce the gestation ration slightly, and prevent constipation by adding a handful or more of linseed oil meal or wheat bran to the ration twice daily.

11) Do not overfeed the sow immediately before or after farrowing. Excess feeding before pigs are 7 to 10 days old may result in caked udder or mastitis, and in heavy losses of newly-farrowed pigs.

12) Provide dry, warm, comfortable farrowing pens and houses that are well ventilated and free from drafts. Use electric pig brooders or other means of temperature control to save newborn pigs in cold weather. Heated pig brooders usually save 1 or more pigs per litter. Guard rails will reduce pig losses from overlying, especially when brooders are not used.

13) Earmark litters for identification in the selection of future breeding stock, and for segregation in case disease makes isolation of the litter necessary.

14) Prevent anemia in pigs confined away from the soil by keeping some uncontaminated sod in the farrowing pen daily, until they are old enough to eat grain or other solid feed. An iron sulfate (copperas) solution applied to the sow's udder daily also is effective.

15) Creep-feed suckling pigs to reduce injuries and death losses.

16) Boars and gilts should be at least 8 months of age and well developed before being used for breeding purposes. Select replacement boars and gilts from the litters that are the best at weaning time.

17) Avoid purchasing bred sows or sows with litters in the usual community sales barns, and the hauling of sows and litters or feed in disease-contaminated trucks.

18) Do not hesitate to write to the College of Agriculture of your state for information on swine feeding and management.

S/C. M. VESTAL, *Chairman*

M. L. BAKER

J. T. CUNHA

DAMON CATRON

J. L. KRIDER

W. L. ROBISON

Phosphorus deficiency in young chicks is manifested by loss of appetite and weakness, with death resulting in ten to twelve days, according to Cornell University workers.—*J. Nutr.*, Feb. 10, 1948.

Relation of Cobalt Insufficiency to Ketosis

That manifest or subclinical cobalt deficiency may be one of the causes of ketosis—or, likewise, that ketosis may in some cases be a symptom of cobalt insufficiency—is expressed by Henderson, of the Ontario Veterinary College (*Rept. Ont. Vet. Coll.*, 1946-47). While only a limited number of field cases of ketosis were studied, the results of cobalt sulfate treatment were so encouraging that further investigations are warranted.

Ten cases were studied in one herd where lack of cobalt was likely (bordering Lake Ontario), but 12 other cases were dealt with in widely separated areas where such deficiency was not known to exist as a herd problem. In all of the cases, the diagnosis of ketosis was confirmed by a positive urine test and usually by a positive test of the milk. The animals selected for the 10-cow study were either suffering from ketosis or had once had it. Under cobalt sulfate therapy, alone the clinical cases recovered and returned to normal production, and there was no recurrence of ketosis in the others. In eight of the 12 random cases so treated, the appetite improved within a day or two and milk production returned to nearly normal within a week; the remainder were not benefited.

The dosage was either (1) 0.5 oz. daily of a solution composed of 2 oz. of cobalt sulfate in an imperial gallon* of water, or (2) 1 tablespoonful twice daily of a solution made up of 1 oz. of cobalt sulfate in an imperial gallon of water. Dosing was continued for two to three weeks, with less frequent doses sometimes being given after the first three days.

*The imperial gallon contains 277.274 cu. in., as compared with 231 cu. in. in the U. S. gallon.

Feed for Sows.—Overfeeding the brood sow may cause pigs to scour. The sow should receive no feed the first day, only warm water. Bran or oats should be fed the next day, and the ration gradually augmented over a two-week period to get her on full feed.—*R. B. Cathcart, Kansas State College.*

Yeast extract in large doses has a favorable effect on fat absorption.—*Black and Fourman, Brit. Med. J., Oct. 25, 1947.*

Thiamin in Calf Nutrition

The need for thiamin in the diet of calves was demonstrated impressively by University of Illinois workers (*J. Nutr.*, 35, Feb. 10, 1948:137-145). On a highly purified diet in which thiamin was the controlled factor, 7 newborn dairy calves all developed acute or chronic thiamin deficiency symptoms.

The acute syndrome developed in 4 of the 7 calves and was characterized by nearly complete anorexia for one or two days during which there was severe scouring that caused dehydration and collapsed veins; these cases did not respond to intravenous thiamin and died within twenty-four hours after the onset of scouring. The chronic syndrome developed in the other 3 calves and began with anorexia that preceded other symptoms by several days. Progressively, there was a mucous discharge from the mouth and eyes, poor coordination and marked weakness in the legs—causing the calves to spread sideways and fall when forced to stand—along with mild diarrhea and slight dehydration. In the chronic group, 2 had convulsions and the third showed constant muscle twitching and trembling.

Thiamin treatment in the early stages of the 3 chronic cases gave "almost miraculous" results, but 2 of these animals were



—*Journal of Nutrition*
Thiamin deficient calf.

purposely deprived of thiamin after the initial treatment and died with acute symptoms several weeks later. The other calf continued to receive thiamin in its diet and made an uneventful recovery.

Seven control calves, regularly fed the purified diet plus thiamin, developed none of the typical symptoms. Sulfonamide

therapy corrected cases of scours and respiratory disturbance that developed in these controls, but it was ineffective in the thiamin-deprived animals. All except one of the 14 newborn calves used in this study received colostrum for twelve to forty-eight hours prior to being placed on purified diets.

The authors (Johnson, Hamilton, Nevens, and Boley) concluded that the bovine species requires thiamin, supplied either in the diet or by the symbiotic action of rumen or intestinal microorganisms.

Vitamin Levels in Colostrum.—One reason for the high nutritive value of bovine colostrum is its concentration of important vitamins. Ohio studies (*J. Dairy Sci.*, Dec., 1947) showed that first-milking colostrum contained ten times more carotene, six times more vitamin A, and three and three-tenths times more riboflavin than normal milk obtained at the twentieth milking. The levels of these constituents declined rapidly with successive milkings and, in fact, by the end of the third day (sixth milking) after parturition, the levels were about the same as those of normal milk.

Liver storage of vitamin A in an aqueous medium may be double or even triple that of the vitamin in oily solution.—*J. Nutr.*, Feb. 10, 1948.

Powdered Egg Shells

Although there is no easily obtainable information on how many tons of egg shell are carted away as so much waste, it appears that egg breakers, as some have already done, in the future will grind and dry egg shells and market the product as a highly assimilable feed or food supplement. Dried egg shells contain:

Calcium carbonate	90.03%
Protein	4.56%
Fat	0.14%
Moisture	0.84%

This formula, as an ingredient in livestock and poultry feeds, speaks for itself. For human food, it is proposed as a means of augmenting the low calcium content of dried eggs. Trials have shown that it does not affect the flavor of scrambled eggs. Eight dollars a ton is mentioned as the market price of dried egg shells.—*From U. S. Egg and Poultry Magazine.*

New Views on Cobalt Therapy.—Cobalt is one of the least understood, yet most promising, minerals in animal and human nutrition. Recent reports on its possible usefulness in ketosis in dairy cattle and indications that it influences and improves iron utilization in the human body (thereby helping to counteract the influence of inflammation) are but two examples of the new horizons for this element.



—Acme Photo

A mixture of urea and molasses sprayed on grain stubble and on dry range grasses may provide western cattle growers with a satisfactory way of feeding cattle and saving grain at the same time. These cattle in a California field seem interested in the spray.

EDITORIAL

Who Should Pay for Federal Meat Inspection?

Government funds supported federal meat inspection for over 40 years—from 1906 to the middle of 1947. The Congress of 1906, whose meat inspection legislation is still largely in force today, pronounced the use of public funds for this purpose as "sound governmental policy and wise legislative practice." And so it remained until last year when Congress decided, in the interests of "economy," to transfer this item of expense to packers operating under federal supervision, notwithstanding that the time-proved policy of federal financing had proved to be in the best interests of the government and of the people.

It is doubtful if any other government agency has won greater public confidence than the Meat Inspection Division of the Bureau of Animal Industry. The blue stamp on meat from federally inspected plants is a symbol of protection and safety—in the market and in the home. It is a little-discussed symbol, however, because the American people have come to take it for granted as denoting a service their government renders.

Last year, when it was proposed that Congress transfer the costs of federal meat inspection to packers operating under supervision, the AVMA opposed the move as wrong in principle and voiced its dissent in a statement to Congress. Association officials were not concerned with the economic aspect of assessing these costs against the packers, nor did they question the ability of federal veterinarians to perform faithfully and efficiently under the "packer pays" arrangement. But Association officials did feel, and so told Congress, that the move could be susceptible of compromising the prestige and status of one of the most important services rendered by the veterinary profession. This viewpoint was favorably recognized by the Senate Committee on Agricultural Appropriations but not by the House, with the result that the change was made, effective July 1, 1947.

Now, identical bills, S. 2256 and H.R. 5675, have been introduced in the present session of Congress by Senator Kem of Missouri and Congressman Gillie of Indiana, respectively, to restore the *status quo*. The bills read "that the cost of inspection rendered on and after July 1, 1948, under the requirements of laws relating to federal inspection of meat and meat food products, shall be borne by the United States."

At the direction of the Board of Governors, the AVMA has reaffirmed its stand and has filed statements endorsing the proposed legislation with the Senate and House committees on agriculture.

Foot-and-Mouth Disease Research

We hope that every reader will study the article by Dr. William A. Hagan in this issue. Age-old prohibitions against research work in this country on the virus of foot-and-mouth disease need to be reconsidered in the light of current conditions. Undiscriminating opposition to properly conducted research in the United States seems unrealistic, in view of the danger which may confront us for a long time from the infection in Mexico; it also seems unscientific, in view of the modern techniques and exacting safeguards which would be applied in any research facilities established here. Agreement upon the great need for research upon foot-and-mouth viruses and vaccines by our own investigators is practically unanimous, as brought out in the extended hearings before a Congressional committee several weeks ago. The big question is, Where should the work be done? Dr. Hagan's thoughtful exposition should do much to clarify the thinking of all interested groups and facilitate their arriving at a final decision.

Between the sparring of streptomycin and BCG, tuberculosis for the first time seems to be on the defensive.

State Official Objects to "Plain Talk" Editorial

Dr. T. O. Brandenburg, executive officer and state veterinarian, North Dakota Livestock Sanitary Board, spent two weeks in Mexico early this year, observing the foot-and-mouth disease program there. Upon his return, and after reading the editorial, "Time for Plain Talk on Foot-and-Mouth Disease" in the February JOURNAL, Dr. Brandenburg wrote a letter objecting to the "editorial attack on the persons directing the campaign" and suggested that the "harsh judgment" expressed in the editorial be modified. Parts of his letter follow:

The program against the disease in Mexico has not collapsed, and the funds that the United States has expended on it have not "gone down the drain," if by these terms is meant the failure of the program and the waste of the money expended on it. It is true that the pressure of events has compelled—at least temporarily—the abandonment of previous full-scale attempts to eradicate the disease. But to term this development a collapse of the program, is to ignore the efficacy of the campaign forces in keeping the disease confined within the area of original infection. . . . With the justifiable fear . . . of the terrible economic loss that would follow spread of the disease to the United States, \$35,000,000 is not an exorbitant bill to pay [to] avoid that spread.

Regarding the editorial comment on the government's failure to present all the facts, Dr. Brandenburg says:

. . . This does a grave injustice to our personnel in Mexico. . . . Those in charge cannot admit failure [while] the issue is in doubt. You do not run up the white flag while you are still able to fight. The situation was replete with problems but [which] seemed likely of solution. . . . [When] the slaughter and burial program fell short of realization, while inflicting real hardship on those in Mexico least able to bear it, they promptly admitted the situation and called this part of the program off. This took courage. It stands out in refreshing contrast to other instances in which administrative agencies have sought to continue their efforts long after they had abandoned any hope of success.

In view of the situation, I believe that the USDA has been as factual as possible in its reports . . . our men are working on the soil of a foreign government and what could be said about program progress was subject to a range of diplomatic considerations [which] are not to be brushed aside, as anyone who has had contact with our State Department . . . will know.

. . . the American veterinarians working on the Mexican program are sincere and conscientious . . . and have had to cope with one of the toughest diseases known, under circumstances of great difficulty. This is one of the most difficult assignments ever faced by any group of veterinarians and has to be faced on foreign soil. . . . They expect misunderstanding from the lay public . . . but not an attack from members of our profession from whom they have every right to look for professional understanding.

[In referring to "collapse of the program," the editorial quoted, as examples, two of the many criticisms which appeared in livestock and agricultural papers after the change in method of handling the Mexican outbreak was announced by the USDA. The editorial

was not an "attack" on the persons directing the campaign in Mexico, but did attack (if that is the right word) the policy which kept nearly everyone—apparently even the special subcommittee on foot-and-mouth disease of the House Agriculture Committee and the Advisory Committee to Secretary Anderson—in the dark as to the unfavorable developments in Mexico. In the editor's judgment, these developments could have been reported without violating diplomatic niceties or destroying the morale of our workers, but with sufficient reality to have avoided the criticisms which arose when the serious state of affairs became known. Apparently, an undertaking of almost heroic proportions and against great odds has suffered from official censorship to an extent that no true appreciation of its magnitude was given to either the public or the profession.

The JOURNAL has never questioned the ability, integrity, and efficiency of BAI Chief Simms, the other veterinary officials, and the technicians who have worked in Mexico with great courage and under serious handicaps.—ED.]

Important Notice re Veterinary Corps Commissions

The following was received just before going to press from Col. George L. Caldwell, Veterinary Division, Office of the Surgeon General, Department of the Army:

The Veterinary Corps is working short-handed. The procurement of Reserve officers for active duty is slower than the loss rate, and the shortage of officers will become even more critical during the next six months when a large group of officers that entered service in 1946 become eligible for separation. However, present world conditions may well stimulate a greater interest in active military service. It is expected that the publication of *Department of the Army Circular No. 67* on March 15, 1948, which provides for the initial appointment in the Reserve of veterinarians who have had no previous military experience, will result in an increase in the number of applications. Upon appointment they may apply for immediate active duty. The circular provides that applicants with over one year of professional experience may be appointed in the grade of first lieutenant, with over five years in the grade of captain, and with over ten years in the grade of major, provided they are not over 33, 37, and 45 years of age, respectively. Interested individuals may obtain the necessary forms for submitting applications for appointment and active duty from any post, camp, station, recruiting office, Army headquarters, The Adjutant General, or Surgeon General.

Any veterinarian now holding a commission in the Veterinary Corps Reserve, who had wartime service under an AUS commission, may apply for recall to active duty in the grade held by him prior to processing for separation from

active duty. Those who served under an AUS commission but who did not accept an appointment in the Reserve at the time of separation may submit an application for appointment to The Adjutant General, using WD AGO Form 170 which may be obtained at any Army or Air Force installation.

Those who apply for extended active duty may elect to serve for one, two, or three years by designating Category I, II, or III on the application for extended active duty (WD AGO Form 160).

MEAT AND DAIRY HYGIENE TRAINING FOR RESERVE OFFICERS

Adjutant General of The Army Letter, dated March 9, 1948, announces the availability of quotas for the 59th class of the course in Meat and Dairy Hygiene at Chicago Quartermaster Depot beginning May 10, 1948, and terminating July 30, 1948. Quotas are available in this class for officers of the Veterinary Corps Reserve, who are not now on active duty but may apply for active duty for the purpose of pursuing the course of instruction. Any Reserve Veterinary Corps officer interested in taking this course should apply through his Reserve headquarters. The 60th class which will begin in early August will be officially announced at a later date. Each class numbers about 25 students and the number of Reserve officers that can be accommodated in any particular class will be dependent on the number of active duty officers applying for admission.

Advertising Drugs

Obviously based to a large extent upon the recommendations made by the Council of Pharmacy and Chemistry of the American Medical Association, which has won worldwide acclaim for its decisions and its fair play, the Federal Trade Commission surveyed 412,950 newspaper advertisements last year in addition to over 600,000 radio commercials. The fact that 55.8 per cent of these pertained to drugs showed that drugs afford the biggest of all fields for misleading advertisements. Cosmetics were second with 16.9 per cent of these vast totals, and human and animal food products were third with 5.9 per cent.

This report comes at a time when only the state medical journals of New York, Illinois, California, and Rhode Island are not members of the Coöperative Medical Advertising Bureau, which follows the standards established by the Council in its acceptance of advertising. The Council makes a plea in its own behalf (*J. Am. M. A.*, Feb. 7, 1948), emphasizing how Editor Simmons was vilified and Professor Billings was threatened with a suit

for libel for daring to challenge the worthiness of certain advertised drugs when it (the Council) began to make headway against the "sure cures" of the nineteenth century. A long editorial on the subject (*ibid.*) admits that the trend is a delicate one to handle. Only one thing is as clear as crystal. The best asset of those who live in, or by, any branch of medicine is the prosperity that a good name insures. The Council of Pharmacy and Chemistry, the Food and Drug Administration, and the Federal Trade Commission coöperating have brought that asset to clinical medicine, to the commercial laboratory, to the public health service, and to the livestock sanitary program, and have saved the people millions of dollars which would otherwise have been spent for spurious drugs, food, and apparatus.

It is hard to conceive of any situation that would bring about a more prompt and general collapse of our national economy than a widespread infection and general distribution of foot-and-mouth disease.—*Nat. Live Stock Prod.*, Jan., 1948.

The hardest obstacle to overcome in preventive veterinary medicine is the gregarious life of farm animals. Preventing the transmission of bacterial, protozoan, and metazoan infections from animal to animal has difficult economic barriers to surmount.

LIVESTOCK HEALTH ODDITIES



CURRENT LITERATURE

ABSTRACTS

Mucoid Brucella Vaccine

Cell suspensions of *Brucella suis* M phase 2 were irradiated with ultraviolet light to render all but a few cells in a 1-mg. dose nonviable. When injected into guinea pigs, they produced a high degree of immunity against experimental infection with *Brucella suis* and *Brucella melitensis*. The vaccine-treated guinea pigs that were found free from infection after exposure did not show specific agglutinins in the blood serum in dilutions of 1:25 or above. The vaccine is being tried in other animals.—[I. F. Huddleson: *The Immunization of Guinea Pigs with Mucoid Phases of Brucella*. *Am. J. Vet. Res.*, 8, (Oct., 1947): 374-379.]

The Present and Future Aspects of Military Veterinary Medicine

Plans for the future are being influenced by new developments in atomic, Arctic, and aerial all-out global warfare. These plans are being modified to conform to recent changes in the organization of the Army and other armed forces, the de-emphasis on the use of animal transport, added emphasis on food inspection, and demands for veterinary service in occupied countries.

Atomic war will affect survivors through contact with food, clothing, and shelter subjected to radiations. Veterinarians will participate in the inspection and decontamination or destruction of food as well as in the treatment and disposal of animals remaining alive following exposure.

"To approach this problem intelligently we must have the answer to several questions. What is the tolerance dose and effect of radiation on various species of animals? What temporary and permanent effects will be manifested in dairy herds, breeding animals, feeders, growing stock, and poultry? How may radiation sickness be detected early in animals and a proper diagnosis and prognosis made? What special techniques or deviations from normal procedures will be required in slaughtering and utilizing exposed animals? What carcasses or parts thereof should be discarded? What is the danger to man in working with or eating meat derived from radiated animals? How may we detect radiation and evaluate its effects on hay, grain, barns, stockyards, and pasture lands?"—[Wayne O. Kester, Colonel, V.C. Chief, Meat and Dairy Hygiene Branch,

Veterinary Division, Office of the Surgeon General, Washington, D. C.; presented at the Association of Military Surgeons' Convention, November, 1947, Boston, Mass.]

Infectious Anemia Virus Present in Horse Serum

In 1943, Kasai and his coworkers presented a simple method for the inactivation of infectious anemia virus present in immune horse serum without impairing the immune bodies therein.

The method indicated is to place the immune serum, to which has been added phenol in the amount of 0.5 per cent, in an incubator (37 C.) for seven days.

The authors, to ascertain the results obtained by Kasai *et al.*, conducted three experiments in each of which a different strain of virus was used. Eighty to 100 cc. of carbolized (0.5%) virus serums incubated for the required periods (12-168 hours), and of the control virus serums left in the refrigerator, were inoculated into each of 13 and 5 horses, respectively, which had been ascertained to be free from infectious anemia. Inoculations were made subcutaneously in one group of animals and intravenously in another group. The authors examined the clinical, hematologic, and histologic (by means of liver puncture) changes occurring in the horses during the three months subsequent to inoculations. One animal which was inoculated with "carbolized virus serum," incubated for twelve hours, contracted infectious anemia with typical symptoms. All other experimental animals except the controls remained normal during the period of observation.

Presumably to trace inapparent infection of infectious anemia in the horses, 60 cc. of defibrinated blood or 100 cc. of serums, collected from animals which remained healthy throughout the period of observation, were injected into 7 normal horses. These animals remained normal throughout the observation period (58-72 days).

Control animals which were inoculated with noncarbolized serums containing the virus of infectious anemia, which had been maintained under refrigeration, manifested typical symptoms of the disease.

It is the author's opinion that the infectious anemia virus present in the carbolized serum remains active after twelve-hour incubation

(37 C.), but becomes inactive after incubation for twenty-four hours.—[S. Miura, T. Kunita, K. Sionoya, and S. Ueda: *Experimental Studies of the Simple Inactivation of Infectious Anemia Virus Present in Horse Serum*. Jap. J. Vet. Sci., 9, (1947): 86-102.]—K.F.B.

Russian Veterinary Colleges

The veterinary colleges of the USSR are organized under an independent head in the ministry of higher education. At present, there are 35 colleges of higher veterinary education, with a total of 12,114 students enrolled. The course is five years. These colleges should not be confused with the "middle schools," or high schools for technicians. Most of them are badly in need of buildings, instruments, and drugs. The ministries of agriculture, of the meat and dairy industry, and of the poultry industry, which are responsible for the financing of the veterinary institutions, have been slow to discharge their obligations in the postwar rehabilitation of veterinary education.

A new teaching and research program has been developed by special intercollegiate conferences on methods in clinical work, pathology, food inspection, nutrition, microbiology, and animal husbandry.

The previous teaching plan was defective in laboratory and clinical training. The curriculum was overloaded. In certain years there were forty-two hours of instruction per week. The students had no opportunity to work individually. The laboratory requirements in the preclinical subjects were reduced. In anatomy, the student did not study the muscles, nerves, and blood vessels by individual dissection. The preparation of histologic slides by students was omitted and students often did not see the essential physiologic experiments. The course in animal husbandry was entirely theoretical in many institutions. Bacteriology was taught without laboratory technique. The course in pharmacology was deficient in the pharmacodynamics of new drugs, in prescription writing, in posology, and in practical work in the pharmacy. Nor did the students master the technique of autopsy.

As a result of these faults, the graduate veterinarian, while well trained in theory, was poorly oriented in the organization of disease-control measures on the state and collective farms. The young veterinarian was frequently graduated without having learned such practical techniques as the diagnosis of pregnancy, everyday surgical operations, prescription writing, and intravenous and intratracheal injection. In recent years, veterinary science has been enriched by new diagnostic methods, which remain unused in the field. Veterinarians have been especially weak in clinical hematology.

With the 1947-1948 academic year, a new curriculum was initiated in all of the veter-

inary colleges. The new plan provides for division of the clinical work. For each subject, there will be sixty to one hundred and ten clinical hours to supplement the lecture course. This obligatory clinical work is to be carefully organized by the staff, so that each student is required to learn the necessary practical methods. In schools where there are no clinics, the animals in the local slaughterhouses will be utilized for practice in surgery, diagnosis, and the administration of drugs. Where a polyclinic is attached to the institution, the students in the fourth and fifth years will be required to participate daily.

In the new curriculum, the number of hours of instruction per week for upper classmen will be about thirty-two; in the fifth year, twenty-four. This will allow the students more time for clinical work. It will also be possible to schedule one- or two-day trips to state and collective farms for practical training in control of infectious and parasitic diseases.

Henceforth, clinical directors will require fourth-year students to keep histories on cases in special surgery, sporadic diseases, and obstetrics. Fifth-year students will be required to keep case records on infectious and parasitic diseases, with subsequent presentation of the case histories.

Farm practice in the new curriculum will be conducted from May 15 to August 1 during the fourth year. The students will be on the farms during a period of increased incidence of disease and massive prophylactic and therapeutic measures. They also will become familiar with the methods of storing feed. The winter farm practice period will be held in February and March of the fifth year. Students are assigned singly to various farms for study and must live in the nearest veterinary establishment (hospital, laboratory, meat inspection station).

The author expresses an interesting attitude toward student admissions when he says that the small number of students accepted by some institutions (50 in the first year) allows no opportunity to develop the departments of instruction. The result of this policy is that the faculty remains "dwarfed." Several such institutions have closed. According to the current plan, the number of admissions at most schools will be increased and stabilized.

Graduate education in veterinary institutions has also been inadequate. Previously, graduate training was conducted without regard for the personnel requirements in the various specialties. As a result, there is a lack of instructors in obstetrics, pharmacology, and food inspection. Steps are being taken by the ministry of higher education to correct this situation. (The doctorate in veterinary medicine is a graduate degree in Russia, as in most foreign countries.)

The author concludes with the assertion that the teachings of Marx and Lenin must take a

conspicuous place in the education of veterinarians. The entire teaching staff must participate daily in this indoctrination.—[V. S. Yershov, administrator of Veterinary and Zootechnical Colleges, Ministry of Higher Education, USSR: *Veterinary Colleges in the New Academic Year* (title translated). *Veterinariya*, 24, (Aug., 1947): 4-6.]—R.E.H.

Venipuncture

In a previous article (*Veterinariya*, Jan., 1947), A. E. Kolos recommended a method of venipuncture in which the needle was inserted into the jugular vein in a direction perpendicular to the skin and then turned so as to lie lengthwise in the lumen. Malakhov objects

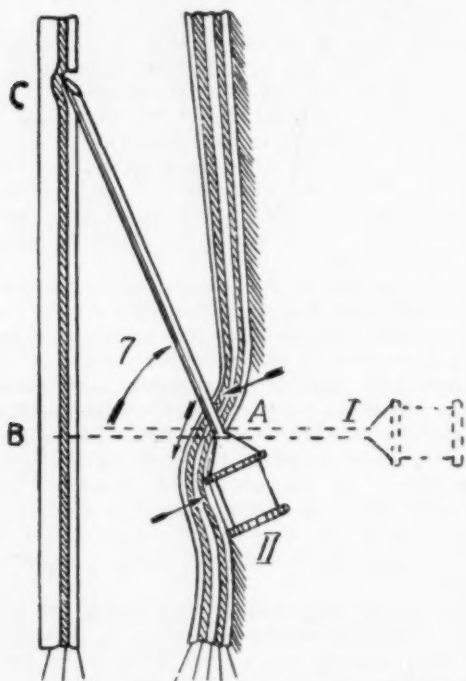


Diagram of puncture of the vena jugularis by Kolos' method.

I—First direction of the needle and the depth of penetration of the tissues; II—final position of the needle in the vein; A—site of puncture of the venous wall on the cutaneous side; B—puncture of the medial wall; C—site of the perforating and lacerated wound.

The straight arrows indicate the resistance of the displaced tissues. The curved arrow shows the direction in which the needle is turned by the operator.

to this procedure because it results in three wounds of the vein: one at the site of entry, one in the medial wall opposite the site of entry, and a third in the medial wall at the point of the needle in its final position. The skin, subcutem, muscularis cutaneous colli, and the perivascular connective tissue are com-

pressed and displaced when the needle is turned into the lumen. The resistance of these tissues tends to swing the point of the needle into the intima of the medial wall of the vein. The needle acts as a lever of the first class with the shaft as the long arm, so that slight motion of the hub produces considerable trauma at the point. The injected fluid strikes the injured spot before the blood can dilute it. Kolos' method was used in treating 49 horses with trypanflavine (acriflavine). Of these, 19 developed severe phlebitis and periphlebitis. Three cases required surgical intervention because of thrombi and necrosis. The inflammation was observed three to ten days after injection. It originated in the medial wall of the vein above the site of the venipuncture. One of the animals, which had received an intravenous injection by Kolos' method without clinical sequels, succumbed to a volvulus eleven days later. Autopsy revealed no lesion of the lateral wall of the jugular vein, but there was a thrombus and an area of periphlebitis on the medial wall.

On the basis of 12,817 intravenous injections of trypanblue with 9 cases of periphlebitis, the author recommends that the needle be inserted at a 45 degree angle.—[N. V. Malakhov, North-Caucasian Stud Combine: *On the Intravenous Injection of Therapeutic Agents in Horses by Kolos' Method*. *Veterinariya*, 24, (Sept., 1947): 31.]—R.E.H.

Secondary Suture of Granulating Wounds

Secondary suture was employed in the treatment of 65 wounds, most of which were gunshot wounds of horses. Preparatory treatment with hypertonic (3 to 4%) sodium chloride solution, sunlight, and artificial ultraviolet light was continued until the wound had reached a state of healthy granulation. Inflammatory edema and infiltration were controlled by steam treatments. The surrounding skin was protected by applications of petrolatum.

In judging whether or not the wound is ready for closure, the author believes that the gross appearance and the systemic symptoms are of more importance than the bacteriologic examination employed in 17 of the cases. When the wound could be sutured within two weeks, the granulations were not excised, but if suture was delayed for more than two weeks by supuration, it was necessary to excise the granulations. This was done with a sharp scalpel or razor blade. Hemorrhage was controlled with hot tampons moistened in physiologic saline solution. The instruments used on the granulated tissue were then discarded. The skin surrounding the wound was dissected free from the underlying tissues. Incisions 2 to 4 cm. long were made through the skin in sufficient number to permit approximation of the cutaneous margins of the original wound.

Of the 65 cases treated, 49 (75.3%) healed by primary union; 7 (10.7%) healed after partial separation of the sutures; and 9 (13.8%) failed to heal.—[Capt. A. N. Golikov, V.C., Dept. of General and Special Surgery, Veterinary Military Academy: *The Employment of Secondary Suture in Granulating Wounds. Veterinariya*, 24, (Sept., 1947): 26-29.]—R.E.H.

Phenothiazine in Canine Parasitism

Marked anisocytosis with neutrophilia was observed in 2 dogs to which a total of 110 and 160 Gm., respectively, of phenothiazine had been administered over a period of fifty-six days. The dog receiving the greater amount also showed general desquamation of the epithelium. A review of the literature on doses and uses of the drug accompanies the report of experimental results.—[*The Use of Phenothiazine in Canine Verminosis. By Dr. Outubrino Correa, University of Port Alegre, Brazil. Boletín Agronomico, Ns. 119 and 120, November and December, 1946.*]—A.M.-A.

A Survey of Literature from Holland

The following is a continuation of a survey (see February, 1947, JOURNAL p. 130) of the *Tydschrift voor Diergeneeskunde*. Dr. Chas. H. Haasjes, Shelby, Mich., prepared the abstracts.—The Editors.

Nonirritant Borogluconate Solution.—More than 120 trials by L. Seekles, E. Havenga, and J. Vael indicate that sodium-calcium borogluconate (pH 7.2) is less irritant than the usual calcium borogluconate (pH 4.0). The preparation of this neutral, nonirritant borogluconate compound is described in detail [69, (Mar. 15, 1945): 179-193].

• • •
Hemoglobin of Equidae and Other Animals.—Spectrophotometric examination shows the blood pigments of true horses to be quite constant insofar as denaturation of the hemoglobin by alkali is concerned, according to work reported by C. Romyn, Laboratory of Veterinary Physiology, Utrecht [71, (Aug. 15, 1946): 650-654]. The hemoglobin of the zebra, Norwegian horse, man, ape, and carnivore is more highly sensitive to alkali, while that of the donkey, mule, cow, yak, and goat is more resistant.

• • •
New Remedy Against Ectoparasites.—A new product which is not toxic to dogs and cats in therapeutic amounts, while being equally as effective as DDT for killing lice and nits, has been compounded by A. M. Ernst and J. H. Meyers [71, (Aug. 15, 1946): 664-667]. The name of the new parasiticide is I-hydroxy-symmetric-polychlorine-benzene.

• • •
Pendulous Fibroma on Sternum of Cow.—A 6-year-old cow was presented to the Surgical Clinic, Utrecht, for treatment of a large tumor

which was loosely attached to the body at the sternum and which swung like a pendulum when the cow walked. The tumor was so large that the cow had difficulty lying down.

Examination showed the skin to be grey-



Fibroma on sternum of cow.

white, without hair, and closely adherent to the underlying tumor except at the sternum. The tumor, weighing 9½ kg., developed in about four months. Extirpation was performed in such a way [68, (March 1, 1941): 263] that enough skin remained to cover the wound. Histopathologic sections showed the condition to be a fibroma. Healing was rapid, complete, and uneventful.

Leucemia in a Cow

A case is described, which is of particular interest because the attending veterinarian was first called to treat what appeared to be a case of mastitis. There was acute distention of the mammary gland and edema of the ventral thoracic and abdominal regions. Upon examination, this was attributed to interference with the lymph flow from the udder through the supramammary lymph nodes. The teats were too tense to permit manual removal of the milk, but a thick, colostrum-like secretion flowed from a teat cannula.

The lymph glands throughout the body were enlarged, and the microscopic examination of many of the organs indicated replacement of parenchyma cells by large lymphoid cells. It was suggested that the reticulum had become neoplastic and was forming many of these cells which metastasized to other parts of the body.—[W. L. Boyd, A. G. Karlson, D. E. Jasper, A. F. Sellers, and J. R. Collier: *Leucemic Lymphoblastoma in a Cow with Involvement of the Udder. Am. J. Vet. Res.*, 8, (Oct., 1947): 330-337.]

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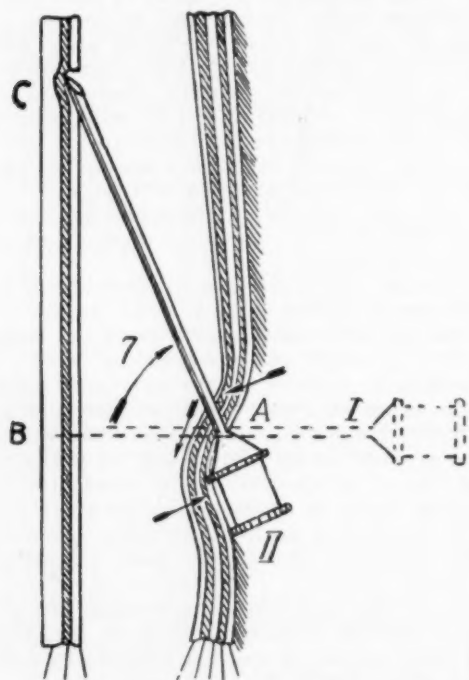


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Of the 65 cases treated, 49 (75.3%) healed by primary union; 7 (10.7%) healed after partial separation of the sutures; and 9 (13.8%) failed to heal.—[Capt. A. N. Golikov, V.C., Dept. of General and Special Surgery, Veterinary Military Academy: *The Employment of Secondary Suture in Granulating Wounds*. *Veterinariya*, 24, (Sept., 1947): 26-29.]—R.E.H.

Phenothiazine in Canine Parasitism

Marked anisocytosis with neutrophilia was observed in 2 dogs to which a total of 110 and 160 Gm., respectively, of phenothiazine had been administered over a period of fifty-six days. The dog receiving the greater amount also showed general desquamation of the epithelium. A review of the literature on doses and uses of the drug accompanies the report of experimental results.—[*The Use of Phenothiazine in Canine Verminosis*. By Dr. Outubino Correa, University of Port Alegre, Brazil. *Boletín Agronomico*, Ns. 119 and 120, November and December, 1946.]—A.M.-A.

A Survey of Literature from Holland

The following is a continuation of a survey (see February, 1947, JOURNAL p. 130) of the *Tydschrift voor Diergeneeskunde*. Dr. Chas. H. Haasjes, Shelby, Mich., prepared the abstracts.—The Editors.

Nonirritant Borogluconate Solution.—More than 120 trials by L. Seekles, E. Havenga, and J. Vael indicate that sodium-calcium borogluconate (pH 7.2) is less irritant than the usual calcium borogluconate (pH 4.0). The preparation of this neutral, nonirritant borogluconate compound is described in detail [69, (Mar. 15, 1945): 179-193].

Hemoglobin of Equidae and Other Animals.—Spectrophotometric examination shows the blood pigments of true horses to be quite constant insofar as denaturation of the hemoglobin by alkali is concerned, according to work reported by C. Romyn, Laboratory of Veterinary Physiology, Utrecht [71, (Aug. 15, 1946): 650-654]. The hemoglobin of the zebra, Norwegian horse, man, ape, and carnivore is more highly sensitive to alkali, while that of the donkey, mule, cow, yak, and goat is more resistant.

New Remedy Against Ectoparasites.—A new product which is not toxic to dogs and cats in therapeutic amounts, while being equally as effective as DDT for killing lice and nits, has been compounded by A. M. Ernst and J. H. Meyers [71, (Aug. 15, 1946): 664-667]. The name of the new parasiticide is I-hydroxy-symmetric-polychlorine-benzene.

Pendulous Fibroma on Sternum of Cow.—A 6-year-old cow was presented to the Surgical Clinic, Utrecht, for treatment of a large tumor

which was loosely attached to the body at the sternum and which swung like a pendulum when the cow walked. The tumor was so large that the cow had difficulty lying down.

Examination showed the skin to be grey-



Fibroma on sternum of cow.

white, without hair, and closely adherent to the underlying tumor except at the sternum. The tumor, weighing $9\frac{1}{2}$ kg., developed in about four months. Extirpation was performed in such a way [68, (March 1, 1941): 263] that enough skin remained to cover the wound. Histopathologic sections showed the condition to be a fibroma. Healing was rapid, complete, and uneventful.

Leucemia in a Cow

A case is described, which is of particular interest because the attending veterinarian was first called to treat what appeared to be a case of mastitis. There was acute distention of the mammary gland and edema of the ventral thoracic and abdominal regions. Upon examination, this was attributed to interference with the lymph flow from the udder through the supramammary lymph nodes. The teats were too tense to permit manual removal of the milk, but a thick, colostrum-like secretion flowed from a teat cannula.

The lymph glands throughout the body were enlarged, and the microscopic examination of many of the organs indicated replacement of parenchyma cells by large lymphoid cells. It was suggested that the reticulum had become neoplastic and was forming many of these cells which metastasized to other parts of the body.—[W. L. Boyd, A. G. Karlson, D. E. Jasper, A. F. Sellers, and J. R. Collier: *Leucemic Lymphoblastoma in a Cow with Involvement of the Udder*. *Am. J. Vet. Res.*, 8, (Oct., 1947): 330-337.]

BOOKS AND REPORTS

Reactions of Animals to Heat

It was concluded that the caloric value of the ration being consumed was significantly and, at times, practically important in determining the reactions of animals to hot conditions, but that the proportion of protein present was of no significance.

White Leghorn and Australorp hens, Middle White sows, and crossbred Border Leicester-Merino ewes were maintained first on high-plane rations and then on low-plane. In each phase they were subjected to normal, hot-wet, and hot-dry atmospheres. Rectal temperature, pulse rate, respiratory rate, and weight changes were recorded.—[K. W. Robinson and D. H. K. Lee, *The Effect of Nutritional Planes upon the Reactions of Animals to Heat. J. of Anim. Sci.*, 6, (May, 1947): 182-194.]

Mycopathologia

This volume carries eight papers on various phases of mycopathology, and two biographies. The two biographies and two of the papers are in English, and five of the remaining papers have brief summaries in English.

There is appended a bibliography of the titles and authors of manuscripts which have been published from 1942 to 1944.—[*Mycopathologia*, Vol. 4, Part 2. 116 pages. Edited by R. Ciferri, Pavia and P. Redaelli, Milan. Dr. W. Junk, Publisher, Amsterdam. 1948.]

Experimental Air-Borne Infection

Many persons heard vague reports and rumors of the cooperative wartime project instituted at Camp Detrick, Md., in December, 1943, and carried through the years as the cloud chamber project of biologic warfare studies. We knew that studies were being carried on to determine the stability and infectivity of a group of bacteria and viruses, but had little conception of the manner in which the studies were being conducted, or of the precautions that were being taken.

This volume is the first publication under the title of Microbiological Monographs, sponsored by the Society of American Bacteriologists. It describes in detail the historical background of the project, the equipment and methods which were designed and perfected, the criteria for the selection of an atomizer which would produce the clouds needed to perform the experiments, and a mass of miscellaneous data upon which the actual studies with bacteria and viruses could be based.

A study of the contents of this volume gives the reader an entirely new and greatly enlarged outlook on the complexity of the problem of controlling the spread of disease. Some

paragraphs are of necessity highly technical, but the veterinarian who is interested in the progress of the means of preventing the dissemination of disease can learn much which will enable him to render a more complete veterinary service to his community.—[*Experimental Air-Borne Infection. By Theodor Rosebury with 11 co-authors from Camp Detrick. 222 pages. Illustrated. Cloth. The Williams and Wilkins Co., Baltimore 2, Md. 1947. Price, \$4.00.*]

Annual Report

The proceedings of the annual meeting of the Veterinary Association of Manitoba, held Feb. 21, 1947, at Winnipeg, list the accomplishments of the preceding year in the address of the president, Dr. H. H. Ross. They are: the activity and interest generated in support of the Western Canada Veterinary Association Act, the increase in number of members who have also joined the AVMA, the appointment of a member to the position of director of the Manitoba Winter Fair, the appointment and activity of a publicity committee, the holding of a picnic and get-together, and the arrangement of a program for the 57th Annual Meeting.

The minutes of the business meeting are presented in some detail, and the leading talks are reproduced in full. Among the latter are: "Viruses and Some of the Diseases they Cause," by Dr. C. A. Mitchell; "Control of Insects Affecting Livestock," by Mr. R. H. Painter; and "Communicable Diseases Affecting Man that are of Interest to the Veterinarian," by Dr. E. C. Chamberlayne. Mention is made of the talks at the dinner meeting by Dr. W. L. Boyd on "The Brucellosis Problem," and on "Sterility in Farm Animals."—[*Proceedings of the Veterinary Association of Manitoba, 57th Annual Meeting, Winnipeg, Manitoba, Feb. 21, 1947. 34 pages mimeo.*]

Tanganyika Veterinary Report

The annual report of the Department of Veterinary Science and Animal Husbandry of Tanganyika Territory (1945) tells of the appointment of the director of Veterinary Services as a member of the Legislative Council. This appointment expresses an increasing appreciation of the importance of work in this field. The authorized total staff of veterinarians is 25, but only seven positions are filled.

The campaign against rinderpest has proceeded with the inoculation of nearly 2½ million doses of vaccine; bovine pleuropneumonia has been eradicated from two provinces and the end is in sight in a third, while anthrax has been kept at a very low level. There was little improvement in the control of trypanosomiasis and tsetse flies.

Pasture management and soil conservation are focal points in a land utilization policy

which will achieve a proper balance between agriculture and animal husbandry. The 6 million cattle and 5 million sheep and goats of the territory are important in antisol erosion measures.

The report states that anthrax is ubiquitous, tuberculosis is rife, foot-and-mouth disease is enzootic, and there is little progress to report in the East Coast fever (a tick-borne disease) problem and in the control of trypanosomiasis and tsetse flies.—[*Annual Report, Department of Veterinary Science and Animal Husbandry, Mpuapiwa, Tanganyika Territory*. Edward Peck, Agricultural Director of Veterinary Services. 41 pages, with tables and maps. Printed by the government printer.]

Amino Acids and Proteins

A discussion, in popular terms, of the essential chemistry and biochemistry involved in the formation of proteins, in their cleavage to amino acids during digestion, and of their rebuilding into complex animal protein molecules. Even in popular terms, the subject matter is necessarily interspersed with numerous chemical formulas, structural formulas, and a minimum of sketches of laboratory apparatus.

Although the book is not primarily a discussion of the clinical aspects of protein synthesis and metabolism, it does contain much information which the veterinarian interested in nutritional problems and their relationship to the maintenance of optimum health will find useful and valuable. The book divides the subject into 12 chapters. There also are 12 authors, but a few of these have written more than one chapter, and a few chapters have been written by an author and a co-author. Each chapter carries a bibliography for more detailed study, if this is indicated.—[*Outline of the Amino Acids and Proteins*. Edited by Melvin Sahyun, with 12 contributing authors. 251 pages. Illustrated. Reinhold Publishing Corp., 330 West Forty-second St., New York, N. Y., 1944.]

Colloid Science

This is a symposium based on a postgraduate course sponsored by the Department of Colloid Science, Cambridge University. It deals with the fundamental properties of the colloid systems, both biologic and nonbiologic. More particularly, it deals with the interfacial phases of colloid systems—the solid/gas interface and the liquid/gas interface. From these stages, it progresses to the more complex case of the disperse systems, as well as interpreting the phenomena encountered with matter in the form of films, membranes, and fibers.

The book is divided into ten chapters, with 11 contributing authors. Such chapters as *Emulsion in vivo* and *Membrane Equilibrium* should be valuable to veterinarians interested in the use of colloids for therapeutic purposes,

but the book is not written for the general practitioner.—[*Colloid Science, A Symposium*. Edited by E. K. Rideal, with 11 contributing authors. 208 pages. Cloth. Chemical Publishing Co., Brooklyn 2, N. Y. 1947. \$6.00.]

Index of Diagnosis

The usefulness of this book to practitioners is attested by the fact that this third edition is appearing only two years after the second. This volume is limited to the discussion of the manner in which the practicing veterinarian may make a completely accurate differential diagnosis, clinical and radiological, of the diseases and ailments of dogs and cats. Previous editions have also discussed treatment, but all such references are deleted from this volume, and will appear in a companion volume which will be called *Index to Treatment*.

To replace the paragraphs on treatment, which have been deleted, a number of new subjects and figures have been added. Diagnosis is the basis of medicine and surgery, and this text provides the means by which each practitioner can raise himself well above the empirical basis upon which treatment without correct diagnosis must rest.

The book is not divided into chapters, nor are problems discussed by organs or organ systems. Instead, each subject to be considered is listed alphabetically, so that it can be found either by following in dictionary style, or by consulting the 26 pages of index.

Dr. Gerry B. Schnelle read the proofs for the book, and his painstaking perusal of the statements made and the subjects covered will mean much to practitioners in the U. S. who would otherwise hesitate before adding to the library a book printed in Great Britain.—[*Index to Diagnosis*. By Hamilton Kirk. 600 pages. 322 illustrations. Cloth. The Williams and Wilkins Co., Baltimore 2, Md. 3rd ed. 1947. Price \$10.]

Cadernos Científicos

This is a new venture in the field of scientific research literature, sponsored by the Pasteur Institute of Lisbon, Portugal. Vol. I, No. 1, appeared in January, 1946; No. 2 in May, 1946; No. 3 in December, 1946; and No. 4 in June, 1947. The *Cadernos* is published in Portuguese, and we have been unable to determine definitely that it is intended to be a quarterly as the four issues of Vol. I seem to indicate. Many of the articles, summarized in English, deal with laboratory procedures or medical techniques which may be applied to veterinary diagnosis and practice.—[*Cadernos Científicos*, R. Nova do Almada, 69, Lisbon, Portugal.]

The soybean has become the fourth largest crop of the U. S. A. The rating is corn, wheat, oats, and soybeans.

THE NEWS

Advance Reservations Point to Big Attendance at San Francisco

Eighty-Fifth Annual Meeting

August 16-19, 1948

Headquarters Hotel—The Palace

Latest figures from the AVMA Housing Bureau on advance hotel reservations for the San Francisco convention, August 16-19, indicate that the total registration may be considerably larger than was first estimated.

Dr. J. M. Arburua, chairman of the Committee on Local Arrangements, said that his committee is "prepared to take care of the crowd, no matter how large." Plans are shaping up

well, he reported, and the program promises to be one of the best in AVMA history.

Advance reservations are being processed as rapidly as possible by the Housing Bureau, and every effort is being made to place registrants in the hotels of their choice. As announced previously, the Palace Hotel, which will be convention headquarters, is in a position to supply rooms to only a small part of the total



Committee on Local Arrangements—San Francisco Convention

First row (left to right)—Dr. S. T. Michael, Vice General Chairman; Mrs. C. B. Miller, Women's Activities; Dr. J. M. Arburua, General Chairman; Mrs. J. R. Beach, Women's Activities; Dr. C. J. Parshall, General Secretary. Not present when the picture was taken: Dr. H. F. Carroll, Registration and Information.

Second row (left to right)—Drs. John McInnes, Exhibits; P. C. Guyselman, Entertainment; N. E. Clemens, Hotels and Housing; K. G. McKay, Publicity and Public Relations; N. H. Casselberry, Meeting Rooms and Equipment; E. G. LeDonne, Reception and Hospitality; C. B. Miller, Garages and Airports; G. B. Simmons, Motion Pictures.

convention gathering; therefore, arrangements have been made for 14 other first-class hotels to furnish accommodations. All are within easy reach of the headquarters. Persons planning to attend the convention are urged to make hotel reservations at an early date—now, if possible—using the form provided on advertising page 38 of this issue.

This meeting offers a rare opportunity for veterinarians and their families to take a memorable vacation in the scenic West while fulfilling an important professional obligation at the same time, and officials handling the convention arrangements believe that this double attraction will be a big factor in promoting the success of the meeting.

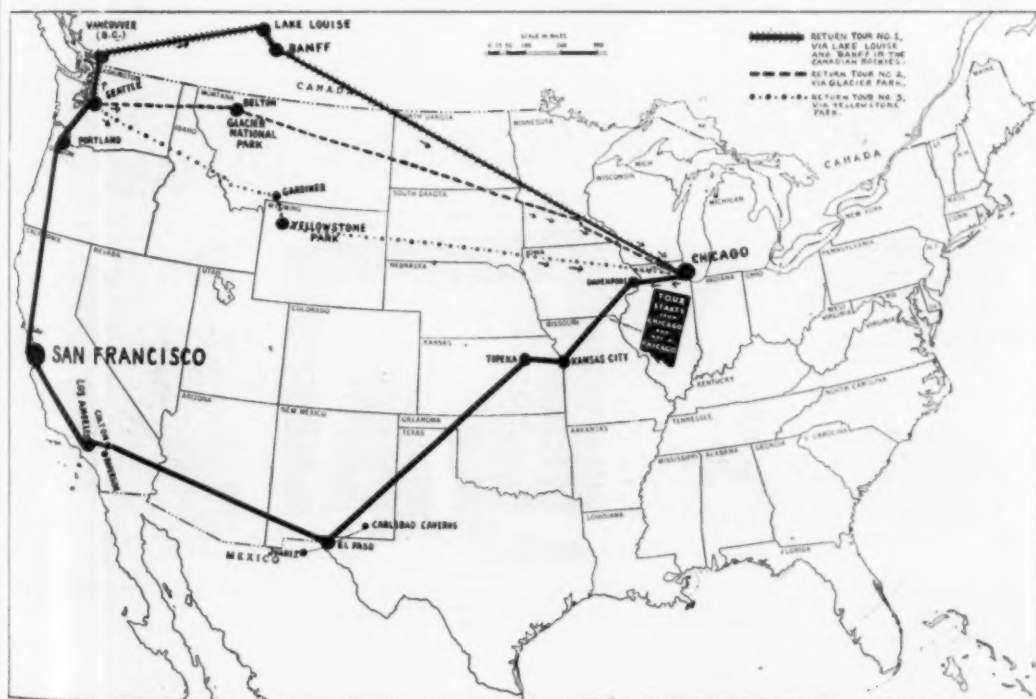
There also is unusual interest in the Special Convention Tour announced in previous issues of the JOURNAL. A number of members already have requested reservations for this tour. It will leave from Chicago on August 9, pick up additional members at designated stops, and travel along the route shown on the accompanying map. Other arrangements are pending whereby special cars will be run from metropolitan points in the East to join up with the convention party in Chicago. A schedule giving detailed facts, along with rates, was published in the April JOURNAL, page 310. (Through a typographical error, the time of arrival at El Paso, Texas, was given in the April issue as "the morning of Aug. 10." This should read "the morning of Aug. 11.")

For the return trip from San Francisco to Chicago, tour party members will have a choice of three routes: (1) *via* the Canadian Rockies, including Lake Louise and Banff; (2) *via* Glacier National Park; or (3) *via* Yellowstone Park. Depending upon the return route selected, the entire trip will take seventeen to nineteen days, including five days spent in San Francisco.

PROPOSED POST-CONVENTION TRIP TO HAWAII

Tentative plans have been made for an official post-convention trip to Hawaii by air, leaving San Francisco on the morning of August 20 and arriving in Honolulu that evening. Dr. Ernest H. Willers, territorial veterinarian, and other members of the profession in Hawaii have projected an ambitious five-day program for AVMA visitors, including tours of farms and dairies, a visit to the largest beef cattle ranch in the Islands, and an "adjourned meeting" scientific program in Honolulu. The return flight would leave Honolulu on the morning of August 26, arriving in San Francisco that evening. Plane fares and estimated total costs of the trip will be published in a later issue.

"The Golden Gate in '48"



Map showing route from Chicago to San Francisco, with choice of three return routes.

The AVMA Rabies Exhibit at AMA Interim Meeting

An exhibit depicting the incidence of rabies and showing illustrations of the animals susceptible to this disease was displayed at the Interim Meeting of the American Medical Association held at Cleveland, Ohio, Jan. 5-8, 1948.

The central panel shows an enlarged picture of a typical rabid dog, and this is surrounded by pictures of other species susceptible to rabies virus. The panel, as originally planned by the committee, called for pictures of rabid animals of the several species, but a diligent search by correspondence and personal contact failed to uncover such pictures. Any veterinarian who has, or can take, pictures of rabid farm animals, wild animals, or household pets will be contributing to the public relations program of the AVMA by sending a glossy print of each such picture.

In addition to the central panel of the exhibit, there are two side or wing panels. One shows the distribution of rabies by states on an outline map and by years and species of animal in a table. The other panel pictures the diagnostic procedure and control methods which have been effective.

Dr. Alexander Zeissig, who attended the exhibit as the representative of the AVMA by permission of the New York State Board of Health, was selected for this post because he has been working directly with the rabies control program in New York State and because this meeting of the AMA was organized pri-

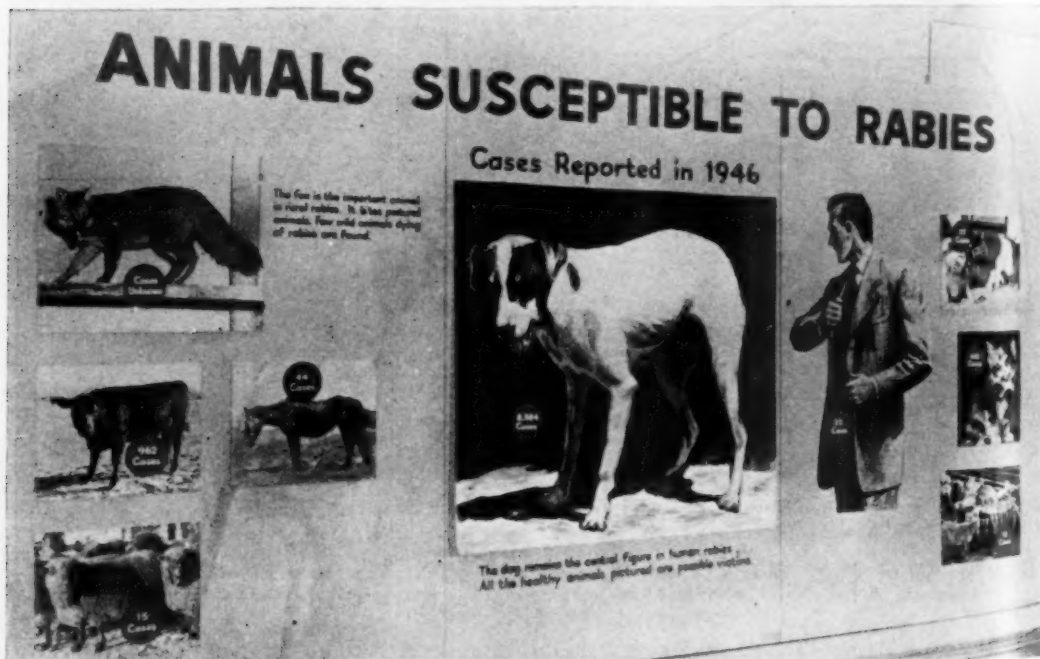
marily for the general practitioners of medicine—physicians who have a wide contact with people from the rural communities.

The committee which designed and collected material for the booth consisted of Drs. J. S. Bengston, C. N. Bramer, R. C. Klussendorf, and W. A. Young. Pictures and data were made available to them by Drs. A. H. Quin and Robert Graham, and by the United States Public Health Service and the Bureau of Animal Industry, USDA.

At the close of the AMA meeting the exhibit was transferred to the Cleveland Health Museum, where it was on display for more than a month under the joint sponsorship of the Ohio State Veterinary Medical Association and the Cuyahoga County Veterinary Medical Association. It was also shown at the annual meeting of the American Animal Hospital Association, Atlanta, Ga., April 19-22, and is now back in Chicago where it will be displayed at the annual meeting of the American Medical Association, June 21-25. Plans call for showing it at San Francisco in August for the Eighty-fifth Annual AVMA Meeting. It will then be available for exhibit elsewhere if requested.

Twenty-Five Constituent Associations Broadcast Livestock Health Programs

"... and, here at our microphone, ready to give us the latest facts about this troublesome livestock disease, is Dr., a well-known



The AVMA exhibit on rabies at the Interim Meeting of the American Medical Association, Jan. 5-8, 1948, Cleveland, Ohio.

member of the Veterinary Medical Association."

This is the type of introductory announcement thousands of listeners to livestock health programs are hearing at least once a week over more than 30 stations in 25 states and provinces of North America. These programs are prepared in ready-to-use, script form by the public relations staff of the AVMA and are issued without charge to constituent associations. Each month, a series of four scripts covering timely animal health subjects are furnished to participating associations, and members of

these groups discuss the subjects over the air, with the station announcer taking part. Some associations have been able to make arrangements with stations whereby transcriptions are made well in advance of the broadcast time, thereby eliminating the need for veterinarians to appear on programs at inconvenient hours.

Practically all of the participating associations report that these broadcasts provide an excellent means of broadening their public relations activities. Constituent associations not listed in the table can obtain information about arrangements for the programs and sample scripts from the AVMA office, 600 S. Michigan Ave., Chicago 5, Ill.

Schedule of State and Provincial Association Broadcasts,* as of April 1, 1948

State	Station	Location	Day of Week	Time	Name of Program
Colorado	KFKA	Greeley	Every Tuesday	11:00 a.m.	(after market report)
Delaware	WDEL	Wilmington	.....	12:30 p.m.	Farm & Home Hour
Idaho	KIFI	Idaho Falls	Every Saturday	6:45 a.m.	Farm Program
Indiana	WFBM	Indianapolis	2nd & 4th Thurs. of each month	12:30 p.m.	Farm Program
Iowa	WOI KAYX	Ames Waterloo	..... .....	..... .....	Farm Program
Kansas	KSAC	Manhattan	.....	.....	Extension Service Program
Kansas & Missouri (coöperative)	KMBC	Kansas City	Every Saturday	12:30 p.m.	Farm Hour
Kentucky	WHAS WHIR	Louisville Danville	Last Fri. of mo. Every Tuesday	12:45 p.m. 11:45 a.m.	Farm Markets
Michigan	WKAR	East Lansing	Every Friday	1:15 p.m.	"Control of Diseases of Farm Animals"
Nebraska	KFAB	Lincoln	Every Wednesday	6:30 a.m.	"Down to Earth"
Nevada	KOH	Reno	.....	1:45 p.m.	"Better Farming"
New York	WJZ WNBC WKNY WICY	New York City New York City Kingston Malone	..... ..... Every Friday .....	..... ..... 1:00 p.m.	Farm News "Modern Farmer" Farm News Animal Health Topics
North Carolina	WHKP WWNC	Hendersonville Asheville	Every Monday Every Monday	12:45 p.m. 12:45 p.m.	Farm Program Farm Hour
Ohio	WOSU	Columbus	Every Friday	12:00 noon	Farm & Home Hour
Oklahoma	KVOO	Tulsa	Every Monday	5:45 a.m.	"Science Serving Agri- culture"
Texas	WTAU	College Station	Every Monday	7:15 a.m.	Veterinary Program
Utah	Mutual System	.....	Every Tuesday	6:45 a.m.	Farm-Home Hour
Virginia	WPUV	Pulaski	Every Friday	1:45 p.m.	Farm Hour
Washington	KWSC	Pullman	.....	12:15 p.m.	Farm Program
Wyoming	Various stations	.....	.....	.....	.....
British Columbia	CBR	Vancouver	Every Friday	12:00 noon	Farm Program
Manitoba	CKY	Winnipeg	Every Tuesday	1:30 p.m.	CBC Farm Broadcast
Ontario	CKCO	Ottawa	Every Wednesday	12:15 p.m.	Agricultural Club
Quebec	CKAC CBF	Montreal Montreal	..... .....	12:30 p.m. 12:00 noon	Programme rural Réveil rural
Saskatchewan	CJRM	Regina	.....	7:00 p.m.	Farm Programme

*In addition to the states and provinces listed, the following have arrangements pending for use of the broadcast series: Alabama, Connecticut, Louisiana, Oregon, and Alberta.

Proposed Amendments to Constitution, Administrative By-Laws, and Code of Ethics

The following amendments, presented at the annual meeting of the House of Representatives in 1947, will come up for final action at the 1948 meeting in San Francisco. They were published in the proceedings of the 1947 session (see the JOURNAL, Oct., 1947, pp. 329-347) and are republished now for the special attention and study of members of the Executive Board and House of Representatives prior to the annual meeting next August.

PROPOSAL No. 1

[The purpose of this proposal is to integrate membership in constituent associations (state, provincial, territorial and other associations affiliated with the AVMA) with AVMA membership. If this purpose is to be effected several changes are necessary as given below.]

Amend Article III, Paragraph (b) of the Constitution, to read:

The general membership, otherwise known as the active membership, shall consist of (1) graduates of veterinary colleges approved by the Association who are members of their respective constituent associations and who have been duly elected in the manner hereinafter provided, and (2) other graduate veterinarians duly elected in the manner provided by the By-Laws, who live in countries outside of the United States and the Dominion of Canada and who are otherwise eligible but do not or could not hold membership in a constituent association.

Amend Article IV, Section 1 of the Constitution to read as follows:

State, territorial, and provincial veterinary associations of North America, The National Association of Federal Veterinarians, and such other official associations as may hereafter become organized in conformity with the general plan of the American Veterinary Medical Association, and which have adopted the same qualifications for membership, shall be recognized upon application as constituent associations provided such application is approved by a majority vote of the Executive Board.

Amend Article X, Section 2 (a) of the By-Laws as follows: Drop the last sentence and replace with the following:

The application from a member of a constituent association shall contain the certificate of its secretary that the applicant is a member in good standing of that body. In the case of an application from a veterinarian residing outside the United States and the Dominion of Canada, it shall contain the endorsement of two members who know the applicant, one or preferably both of whom shall live in the same country as the applicant.

The American Veterinary Medical Association reserves the right to reject the application of any member of any constituent association.

Replace paragraph (b) of Section 3, Article X, as follows:

Members who have been dropped from constituent associations shall be dropped from the American Veterinary Medical Association on official notification by the secretary of the constituent association and shall be reinstated in the same manner. Whenever a member of this Association is dropped for any reason, the secretary of the constituent association in which he holds membership shall be notified promptly.

Replace Section 4 of Article X with the following:

The applications of candidates who reside outside the jurisdiction of constituent associations shall be submitted to the Executive Board and shall be accepted or rejected by that body at any regular or special meeting. These members shall have all of the rights and privileges and be subjected to the same obligations as other active members except only that they are not required to maintain membership in a constituent association.

PROPOSAL No. 2

[The purpose of this proposal is to increase the annual dues from \$7.00 to \$10.00, including subscription to the JOURNAL and was recommended last year by the Executive Board to meet the costs of the expanding program of the Association.]

Amend Article X, Section 3(c) to read:

Dues shall be \$10.00 a year, of which \$4.00 is for payment of one year's subscription to the official JOURNAL of the Association. Dues are payable in advance on January 1 of each year.

Amend Article X, Section 3(d) by striking out "\$7.00" and substituting "\$10.00" in the third line.

Amend the schedule in the same paragraph for the amounts to be remitted each month, in line with the increase in dues provided by the above.

January	15.00	July	10.00
February	14.17	August	9.16
March	13.33	September	8.33
April	12.50	October	7.50
May	11.66	November	6.66
June	10.83	December	5.83

Amend the last paragraph of Section 3(d) to read as follows:

Of the annual dues of \$10.00, \$4.00 is to be credited as subscription to the JOURNAL.

PROPOSAL No. 3

[The purpose of this proposal is to bring about greater stability and effectiveness of the House of Representatives as the legislative and business body of the Association by increasing the length of service of House members. This proposal should also be considered in the light

of the arrangement approved by the Executive Board last year by which the AVMA will pay an amount equivalent to one-half of the round-trip railroad fare and pullman expense of one accredited delegate in attendance at the annual meeting of the House from each affiliated association.]

Amend Article IX, Section 4 to read as follows:

Tenure: Members of the House are elected for four years, which means that they shall serve during four consecutive annual sessions of the Association, except that in the beginning, approximately half of the constituent groups shall be designated by the Executive Board to elect for an initial two-year term in order that all terms of office will not terminate at one time.

PROPOSAL No. 4

[The purpose of this proposal is to relieve the president from the duty of presiding at sessions of the House and to add this duty to those of the president-elect.]

Amend Article II, Section 3.—Duties of the president by deleting "and at all sessions of the House of Representatives."

Amend Article III, Section 2, relating to the duties of the president-elect by adding the following paragraph to follow the present first paragraph:

He shall preside at all sessions of the House of Representatives and shall, if desired, present to the House his program for the coming year.

PROPOSAL No. 5

It is proposed to amend Paragraph 7 of the Code of Ethics by adding the following new sub-paragraph g):

g) No member shall willfully place his professional knowledge, attainments, or services at the disposal of any lay body, organization, group or individual, by whatever name called, or however organized, for the purpose of encouraging unqualified groups and individuals to diagnose and prescribe for the ailments and diseases of animals. Such conduct is especially reprehensible when it is done to promote commercial interests and monetary gain. Such deportment is beneath the dignity of professional ethics and practice; it can be harmful to both the welfare of the animal-owning public and the veterinary profession; it violates principles of humane animal care; it may cause great economic loss and endanger public health and is, therefore, contrary to sound public policy.

PROPOSAL No. 6

It is proposed to add the following new sub-head to the Code of Ethics following present Paragraph 31, and to number it Paragraph 32 as follows:

PHARMACISTS

Paragraph 32.—Licensed pharmacists should be recognized by members of the veterinary profession and their services should be utilized; but any pharmacist, unless he also be qualified as a veterinarian, who assumes to diagnose and prescribe for sick animals or for the

handling of contagious and infectious diseases of animals, should be denied such recognition and support, since his activities may be viewed as prejudicial to the public interest, contrary to laws governing veterinary medical practice, and in violation of state and federal laws made and provided for the control of animal diseases.

If adopted, present Paragraphs 32 and 33 would be re-numbered 33 and 34, respectively.

PROPOSAL No. 7

[The purpose of this proposal is to carry out the recommendation made by the Section on Sanitary Science and Food Hygiene at the 1947 meeting, namely, that the name of this section be changed to "Public Health." In compliance with the recommendation, Dr. Martin D. Baum, present chairman of the section has submitted the following amendment.

As provided in Section 3, Article XIII, of the Administrative By-Laws, relating to amendments, this proposal will be published in three consecutive issues of the JOURNAL and can then come up for final action at the annual meeting in San Francisco.]

Amend paragraph (e) of Section 1, Article XIV, Administrative By-Laws, by changing the words "Sanitary Science and Food Hygiene" to "Public Health."

Dr. Newsom President Colorado A. & M. College

Dr. I. E. Newsom, who has been acting as president of Colorado A. & M. College since the late Dr. Roy M. Green, president, was given leave for health reasons Dec. 10, 1947, was named president of Colorado A. & M. by the State Board of Agriculture, college governing body, at its regular meeting on February 21.

Dr. Newsom, who has been vice-president of the College, will serve as president until a new head of Colorado A. & M. is selected. Dr. Newsom was scheduled to retire July 1.

According to Mr. Raman Miller, board president, the board members felt that Dr. Newsom, a graduate of the College in 1904, a member of the Colorado A. & M. faculty since that time, and dean of the Veterinary Division since it was organized as a division in 1934, deserved the honor because of his long and satisfactory record of service, and that it is to the best interests of the school that he be so named. He is internationally famous in the field of veterinary medicine and has a wide acquaintance among educational and agricultural groups in Colorado and the Rocky Mountain region. His appointment is retroactive to Jan. 23, 1948.

Dr. Newsom obtained a degree as doctor of veterinary science in 1906 from San Francisco Veterinary College and a similar degree from the Kansas City Veterinary College in 1909. In 1941, he was granted an honorary doctor of science degree by the University of Colorado.

He has served as chairman of the Executive Board of the American Veterinary Medical Association, as secretary of the Colorado Veterinary Medicine Association, and as president of the Society of Research Workers in Animal Diseases. In 1938, he inspected veterinary schools in Europe and attended the International Veterinary Congress in Zurich, Switzerland.

Program of Section on Tropical Veterinary Medicine

Fourth International Congresses on Tropical Medicine and Malaria

Departmental Auditorium, Washington, D. C., Thursday, May 13, 1948

As announced in previous issues of the JOURNAL, the program of the Fourth International Congresses on Tropical Medicine and Malaria meeting in Washington, D. C., May 10-18, 1948, will have much of interest to the veterinary profession. Dr. R. A. Kelser, member of the Organizing Committee, who represented the AVMA in planning the program of the Congresses and who has been named as convener of the Section on Tropical Veterinary Medicine, has arranged an outstanding group of papers for that section. The following program is tentative but believed to be reasonably firm.

Thursday, May 13, 9:30 a.m.—12 noon

Session 1.—Trypanosomiasis, Rinderpest, and Newcastle Disease.

Election of Section Officers.

- 1) Surra with Special Reference to its Treatment with Antrypol.
- 2) Murrina (Equine Trypanosomiasis). Dr. Herbert Clark, Gorgas Memorial Laboratory, Panama, Panama.
- 3) Rinderpest. Dr. Richard E. Shope, Rockefeller Institute for Medical Research, Princeton, New Jersey.
- 4) Newcastle Disease in the Philippines with Special Reference to Immunization. Dr. Anacleto B. Coronel, Assistant Chief, Veterinary Research Division, Bureau of Animal Industry, Department of Agriculture and Commerce, Manila, Philippines.

Thursday, May 13, 2:30 p.m.—4:30 p.m.

Session 2.—Foot-and-Mouth Disease, Schistosomiasis, Epizootic Lymphangitis and Salmonella Infections.

- 5) Aphthous Fever (Foot-and-Mouth Disease). Professor G. Flueckiger, Chief Federal Veterinarian, Bern, Switzerland.
- 6) Aphthous Fever (Foot-and-Mouth Disease). Dr. I. A. Galloway, Director of Research Station, Pirbright, Surrey, England.
Commentator on Papers 5 and 6: Dr. H. W. Schoening, Chief of Pathology Division, Bureau of Animal Industry.
- 7) Schistosomiasis in Animals. Dr. G. H. Bhalerao, Officer in Charge Veterinary Zoology Section, Indian Veterinary Research Institute, Itznagar, U.P., India.
- 8) Epizootic Lymphangitis. Brigadier J. J. Plunkett, Director of Veterinary and Remount Service, The War Office, Droitwich Spa, Worcestershire, England.
- 9) Anaplasmosis in Cattle. Dr. G. Dikmans, Zoological Division, Agricultural Research Center, U. S. Department of Agriculture, Beltsville, Maryland.

- 10) Salmonellae in Domestic Animals in Puerto Rico. Dr. Oscar Felsenfeld, *et al.*, School of Tropical Medicine, San Juan, Puerto Rico.

It will be noted that Dr. Kelser has arranged the two sessions of the veterinary section all on one day, so that veterinarians can attend them without an extended stay in Washington. However, several other sections (there are 12 in all) will have papers of definite interest to veterinarians. The complete roster of sections of the Congresses are:

Research and Teaching Institutes
Tropical Climatology and Physiology
Bacterial and Spirochetal Diseases
Virus and Rickettsial Diseases
Malaria
Helminthic Diseases
Protozoan Diseases
Nutritional Diseases of the Tropics
Tropical Dermatology and Mycology
Tropical Veterinary Medicine
Public Health
Medical and Veterinary Entomology

Papers of Veterinary Interest in Other Sections

Section on Tropical, Medical and Veterinary Entomology

Friday, May 14

Ticks in Relation to Disease. Dr. W. B. Herms, Department of Entomology and Parasitology, University of California, Berkeley.

Saturday, May 15

Insecticides for the Control of Lice Attacking Man and Animals. Mr. Raymond C. Bushland, Kerrville, Texas.

Research on Newer Insecticides and Repellents for Insect Control. Dr. E. F. Knippling, Bureau of Entomology and Plant Quarantine, USDA.

Equipment for Applying Insecticides. Dr. F. C. Bishopp, *et al.*, USDA.

Section on Virus and Rickettsial Diseases

Tuesday, May 11

Q Fever. Dr. John Caminopetros, Hellenic Pasteur Institute, Athens Greece.

Monday, May 17

Methods of Rabies Control. Dr. Harald N. Johnson, Rockefeller Foundation, New York. Many other papers of veterinary interest will be given in other Sections of the Congresses.

The Organizing Committee has gone to great expense in providing for the various section programs and the meeting facilities for each section. For example, the first session of the

Veterinary Section will be in the Main Hall of the Departmental Auditorium (located on Constitution Ave., between Twelfth and Fourteenth St., N. W.); provision has been made for immediate translation of papers into three languages as they are presented, and listeners will be able to "tune in" their language on personal head-sets as the authors speak.

Because the international scope of this event presents an opportunity for broadening the influence and prestige of the American veterinary profession, the AVMA, as one of the fifteen sponsoring scientific organizations, is hopeful that a large number of veterinarians will attend.

American Animal Hospital Association

The fifteenth annual meeting of the American Animal Hospital Association was held at the Biltmore Hotel in Atlanta, Ga., April 19-22, 1948. The following program was presented:

The Hon. W. B. Hartsfield, Mayor, Atlanta gave the address of welcome and Dr. C. W. Bower responded.

Dr. W. A. Hagan, dean, New York State Veterinary College, Cornell University, Ithaca, and president of the AVMA: "Virus Diseases and Immunization."

Dr. James H. Steele, chief veterinarian, U. S. Public Health Service, Washington, D. C.: "Responsibility of the Practicing Veterinarian to the Public."

Dr. James Farquharson, Colorado A. & M. College, Fort Collins: "Sutures," and "Brain Trauma" (both illustrated).

Dr. Leonard J. Goss, New York Zoological Park, New York City: "Treatment of Wild Animal Pets" (with illustrations).

Mr. Morris Frank, Blind Division, The Seeing Eye, Inc., Morristown, N. J.: "The Seeing Eye Dog" (with illustrations).

"Treatment of Chronic Ulcerative Colitis," motion picture shown through courtesy of Sharp & Dohme.

Dr. N. O. Tenille, Toledo, Ohio, presented the winner of the Moss Ethics Essay Contest, who read his prize-winning paper.

Dr. C. P. Zepp, Sr., New York City: "Hospital Records."

Dr. John D. Gadd, Towson, Md.: "Surgery Report."

Dr. Otto Stader, Ardmore, Pa.: "New Hospital Equipment."

Dr. Robert L. Anderes, Kansas City, Mo.: "Enteritis-Etiology and Therapeutics."

Dr. L. C. Moss, Colorado A. & M. College, Fort Collins: "Psychosomatic Medicine and the Veterinarian."

Dr. David L. Coffin, pathologist, Angell Memorial Hospital, Boston, Mass.: "The Respiratory Tract of Dogs" (with illustrations).

Dr. M. M. Leonard, Asheville, N. C., was moderator for the symposium on "Skin Diseases of the Dog." Participants were Dr. W. L. Dobes (M.D.), dermatologist, Atlanta, Ga.: "Diseases Communicable to Man"; Dr. Kenneth W. Smith, Sioux City, Iowa: "Nonspecific Diseases"; Dr. John R. Wells, West Palm Beach, Fla.: "Parasitic Diseases"; and Dr. C. P. Zepp, Sr.: "Pyogenic Diseases."

Dr. B. S. Burkhardt, Denver, Colo.: "Deep Tissue Therapy."

Dr. Hadley C. Stephenson, New York State Veterinary College, Cornell University, Ithaca: "Blood Substitutes."

Dr. J. E. Greene, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn: "Small Animal Therapeutics" (with illustrations).

Dr. Hayward S. Phillips (M.D.), Atlanta, Ga.: "Anesthesia."

Dr. J. Stuart Crawford, New Hyde Park, N. Y.: "The Successful Approach in Veterinarian-Client Relationship."

Dr. Mason Weadon, Washington, D. C.: "Treatment of Fulminating Ulcer of the Eye" (with illustrations).

The ladies' program consisted of a visit to the historic cyclorama, a supervised tour of a department store, movies, luncheon, and attendance at the exhibits of the American Animal Hospital Association.

A banquet was enjoyed by members, their wives, and guests in the Pompeian Room of the Biltmore Hotel.

s/R. E. RUGGLES, Secretary.

The San Francisco Convention Program

The Program Committee for the Eighty-fifth Annual Meeting in San Francisco, Aug. 16-19, 1948, has been working diligently during the past weeks, and there is every indication that this work will be well rewarded.

This year, there will be a departure from the manner in which section programs have been presented in recent years. Each section will be assigned one full day for its meeting instead of having successive forenoons or afternoons, as in the past. By eliminating the General Session at 11:00 a.m. on Tuesday and on Wednesday, each section will have an added hour for its meeting.

The chairman and the secretary of each of the six sections have established contacts with speakers from all parts of the country and from all fields of veterinary activity. The program will be highly diversified in order to present the latest findings in all fields of veterinary medicine.

The program for the General Session on Thursday has scheduled speakers who will help to unify and integrate the interests and activities of each section and each individual present, so that every one will appreciate more fully the scope of the work of all other members.

The opening session will be highlighted by the address of President W. A. Hagan. He has had a busy year attending meetings of veterinarians and of persons in related fields. These contacts, added to his normal activity as dean of the New York State Veterinary College at Cornell University and his participation in the inspection of all veterinary colleges in the United States and Canada as a member of the inspecting committee of the Council on Education, place him in a position to keynote this convention to excellent advantage.

The programs for the six sections will be de-

voted not only to keeping abreast of the research and the developments of the past year in each particular field, but they branch out into such varied lines as the place of nuclear physics in health and food supply for man and his animals, the airborne infections, the possible applications of psychosomatic veterinary medicine, and the wider appreciation of the extent and the value of preventive veterinary medicine.

If you want a quick review of what your field of veterinary medicine is doing today and planning for tomorrow

If you want to know just how your work integrates with that of all other veterinarians . . .

If you want to learn the full importance of your profession in safeguarding the health and filling the food needs of humanity

If you desire to meet the leaders and the workers in all of these branches of veterinary medicine

Treat yourself to a vacation and come to
"The Golden Gate in '48."

STUDENT CHAPTER ACTIVITIES

History of the OSU Student Chapter of the AVMA.—The forerunner of The Ohio State Student Chapter of the American Veterinary Medical Association was the Veterinary Literary Society established in 1895. This society, after several successful years, began to decline. A reorganization in the autumn of 1903 brought it new life and prosperity. Leonard W. Goss, now professor emeritus of pathology, was its second president, and Ross P. Marsteller, dean emeritus of Texas A. & M. College, was its secretary. Its purposes were literary, social, and technical. Debating teams were developed, college banquets were sponsored, and outstanding speakers were scheduled to address the student body.

Perhaps one of the outstanding activities sponsored by this organization was the athletic competition between the College of Veterinary Medicine and the College of Agriculture. These events sometimes attracted larger crowds than some of the university events. The success of the veterinary college teams is evident by the many plaques and trophies now seen in the veterinary laboratory building. A certificate was given to each member of the society upon graduation, and it is not uncommon to see these framed certificates in the offices of many practitioners.

In 1930, the Veterinary Literary Society was again reorganized. The new organization, patterned after the American Veterinary Medical Association, was called the Veterinary Medical Association of Ohio State University. As a charter was not granted by the senior organization at this time, the members formulated one of their own. This charter, similar to the one used by the parent organization, served satisfactorily for nine years.

On Nov. 29, 1939, a charter was granted by the American Veterinary Medical Association and the society has functioned since as the Ohio State Student Chapter of the AVMA. Since then, students meeting the requirements have enjoyed all the privileges afforded to members of student chapters.

(To be continued)

Kansas Chapter Officers.—Recently elected officers of the Kansas State College Chapter of the AVMA are: John H. Woolsey, Woodland, Calif., *president*; Sidney Marlin, Atchison, Kan., *vice-president*; Harold Peffly, Ottawa, Kan., *secretary*; Bernard Mowery, Wilsey, Kan., *critic*; and Benjamin R. Drake, Blue Rapids, Kan., *marshall*.

s/HAROLD PEFFLY, *Secretary*.

Veterinary Club Formed at University.—Students of the sophomore and freshman classes in the new school of veterinary medicine at the University of Missouri have joined in organizing a veterinary club, patterned along the lines of student AVMA chapters at accredited veterinary colleges. Dr. Cecil Elder, professor of veterinary pathology, has been elected as faculty advisor of the student organization which has been named The Veterinary Club.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

CLARK, WILBUR G.

Delchester Farms, Edgemont, Pa.

V.M.D., University of Pennsylvania, 1946.

Vouchers: S. A. Steiner and R. C. Snyder.

HELFAND, LOUIS I.

6427 N. 15th St., Philadelphia 26, Pa.

V.M.D., University of Pennsylvania, 1920.

Vouchers: C. E. Mootz and A. R. Miller.

HOFFMAN, WILLIAM F.

1712 State St., Harrisburg, Pa.

V.M.D., University of Pennsylvania, 1939.

Vouchers: H. M. O'Rear and C. P. Bishop.

IKARD, WILLIAM L.

1517 4th Ave. S., Great Falls, Mont.

D.V.M., Kansas State College, 1921.

Vouchers: E. A. Tunncliffe and A. M. Jasmin.

LEECH, J. ALEXANDER

P. O. Box 1320, Jackson, Tenn.

D.V.M., Alabama Polytechnic Institute, 1947.

Vouchers: W. R. Lawrence and C. H. Wright.

LEVESQUE, FRANCOIS

Oka, P. Q., Canada.

D.V.M., New York State Veterinary College, 1936.

Vouchers: J. Dufresne and W. A. Aitken.

PACHECO-PEREZ, DANIEL

Facultad de Medicina Veterinaria, Ciudad Universitaria,

Apartado 11-70, Bogota, Colombia, S. A.

D.V.M., Veterinary Medicine Faculty, Bogota, 1935.

Vouchers: H. Almanza R. and B. V. Alfredson.

POWERS, JAMES F.

Center Street, Dover, Mass.

V.M.D., University of Pennsylvania, 1946.

Vouchers: S. R. Orcutt and A. T. Bowen.

PRICE, EDMUND R.

4214 Old Brook Rd., Richmond 22, Va.

D.V.M., Alabama Polytechnic Institute, 1936.

Vouchers: H. C. Givens and H. S. Miller.

TOMPKINS, RICHARD J.

6018 San Pablo Ave., Oakland 8, Calif.

D.V.M., Washington State College, 1931.

Vouchers: C. J. Parshall and R. P. Cope.

TORRES E., JOSE

Nopaltzin Num. 6, Col. Anahuac, Mexico, D. F.
D.V.M., National School of Veterinary Medicine of Mexico, 1946.

Vouchers: A. Tellez G. and C. R. Omer.

WILLIAMSON, WILLIAM W.

1414-9th St., Modesto, Calif.

D.V.M., Kansas State College, 1935.

Vouchers: A. T. Cook and R. A. Beck.

WOODS, SAMUEL H.

Murfreesboro, Tennessee.

D.V.M., Kansas City Veterinary College, 1912.

Vouchers: J. H. Gillmann and R. C. Klusendorf.

Second Listing

Anderson, Edward P., Room 1126, State House, Lincoln, Neb.

Black, James G., 110 Admiral Rd., Toronto 5, Can.

Blackberg, Solon N., 1263 Pratt Blvd., Chicago 26, Ill.

Bohorquez, C., Jose J., Calle 44, No. 20-38, Bogota, Colombia, S. A.

Mank, George C., 5802 E. Sprague, Spokane 15, Wash.

Nolan, James D., Box 127, Madera, Calif.

Walker, David A., 16 Park St. Morrisville, Vt.

1948 Graduate Applicants**First Listing**

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

MEYER, LAWRENCE D., D.V.M.

Calera, Alabama.

Vouchers: R. S. Sugg and I. S. McAdory.

MOORE, JR., JOHN G., D.V.M.

Evergreen, Alabama.

Vouchers: R. S. Sugg and I. S. McAdory.

SELLARS, CARL M., D.V.M.

P. O. Box 314, Burlington, N. C.

Vouchers: J. E. Greene and I. S. McAdory.

Ohio State University

All of the following applicants, with the exception of those otherwise noted, were vouchered by W. R. Krill and C. R. Cole.

CHECK, JOHN P., D.V.M.

Wauzeka, Wisconsin.

DAVIS, HORACE N., D.V.M.

123 Warren Ct., Lexington, Ky.

DELANEY, DALTON M., D.V.M.

Deerfield, Wisconsin.

EASTERBROOKS, H. LINCOLN, D.V.M.

286 Pleasant St., Concord, N. H.

EHLEBERG, HOWARD F., D.V.M.

Port William, Ohio.

ERNEB, ROBERT J., D.V.M.

26159 Detroit Rd., Westlake, Ohio.

EVANS, LEE, D.V.M.

Butler, Kentucky.

HADLOW, WILLIAM J., D.V.M.

U. of Minn., Div. of Vet. Med., University Farm, St. Paul 1, Minn.

HARTHILL, ALEXANDER H., D.V.M.

611 E. Broadway, Louisville, Ky.

HEY, DONALD W., D.V.M.

Main Street, Oxford, Mass.

KING, NELSON B., D.V.M.

2267 N. High Street, Columbus, Ohio.

KOUSTMER, RALPH F., D.V.M.

29 Chalfonte Pl., Ft. Thomas, Ky.

LUSK, HERALD E., D.V.M.

Kingman, Indiana.

MASON, RICHARD R., D.V.M.

Empire St. and Demeter Dr., Freeport, Ill.

MYERS, DONALD J., D.V.M.

1000 South A. Street, Elwood, Ind.

RANSELL, LEWIS A., D.V.M.

556 Pine St., Greenfield, Ohio.

SANDERS, LLOYD J., D.V.M.

8208 Carnegie Ave., Cleveland, Ohio.

SMITH, HOMER R., D.V.M.

Rt. 1, New Straitsville, Ohio.

YORK, CHARLES J., D.V.M.

110 Irving Pl., Ithaca, New York.

Vouchers: F. H. Fox and C. R. Cole.

University of Pennsylvania

AINLEY, RICHARD G., V.M.D.

Box 889, Woodlake, Tulare Co., Calif.

Vouchers: F. E. Lentz and J. H. Mark.

BENSON, JOHN H., V.M.D.

331 Bellevue Ave., Trenton 8, N. J.

Vouchers: J. D. Beck and J. W. Mills.

COWAN, JAMES H., V.M.D.

Box 302, Parkesburg, Pa.

Vouchers: D. G. Lee and R. L. Berger.

CREAMER, ALAN A., V.M.D.

408 Thayer St., Ridley Park, Pa.

Vouchers: F. E. Lentz and J. H. Mark.

DETWILER, RICHARD H., V.M.D.

22 Kenhorst Blvd., Reading, Pa.

Vouchers: D. G. Lee and T. De Mott.

GARVEY, JOHN J., V.M.D.

4002 Pine St., Philadelphia 4, Pa.

Vouchers: G. A. Dick and W. J. Lentz.

HAMMOND, ROBERT C., V.M.D.

R. D. 3, Wellsboro, Pa.

Vouchers: D. G. Lee and R. L. Berger.

HOLLIS, ROBERT H., V.M.D.

R. D. 1, Charmead Farm, Lansdale, Pa.

Vouchers: D. G. Lee and R. L. Berger.

HOPKINS, DAVID M., V.M.D.

68 Norwood Ave., Upper Montclair, N. J.

Vouchers: W. B. Boucher and F. E. Lentz.

JACKSON JR., JAMES M., V.M.D.

Walnut Park Plaza, 63rd and Walnut, Philadelphia, Pa.

Vouchers: T. De Mott and F. E. Lentz.

KELTON, RICHARD C., V.M.D.

3920 Pine St., Philadelphia, Pa.

Vouchers: J. D. Beck and E. A. Churchill.

KLINE, JOSEPH I., V.M.D.

c/o Dr. John Gadd, 707 York Rd., Towson, Md.

Vouchers: T. De Mott and D. G. Lee.

LEBEAUX, MAXIM I., V.M.D.

30 Fruit St., Shrewsbury, Mass.

Vouchers: C. E. Mootz and D. K. Detweiler.

MC CLEMENT, JAMES M., V.M.D.
1112 Try St., Monongahela, Pa.
Vouchers: W. J. Lentz and J. D. Beck.

PAGE, HARRY H., V.M.D.
912 Unruh, Philadelphia, Pa.
Vouchers: D. G. Lee and T. De Mott.

ROBERTS, HAROLD D. B., V.M.D.
Meadowridge Farm, Linwood Pa.
Vouchers: N. R. Mc Manus and R. C. Snyder

ROTHMAN, MARVIN, V.M.D.
4948 Germantown Ave., Philadelphia, Pa.
Vouchers: H. M. Martin and J. W. Mills.

ROWAN, CRAIG, V.M.D.
280 W. 11th St., New York, N. Y.
Vouchers: D. G. Lee and J. D. Beck.

RUDER JR., FREDERICK G., V.M.D.
300 N. Pleasant St., Amherst, Mass.
Vouchers: E. A. Churchill and H. M. Martin.

SACKETT JR., IRVING D., V.M.D.
102 Lake St., Girard, Pa.
Vouchers: J. D. Beck and F. E. Lentz.

SHOOK, JOHN C., V.M.D.
110 Aikens Place, State College, Pa.
Vouchers: F. E. Lentz and T. De Mott.

SKYER, MAURICE H., V.M.D.
R. D. 2, Newburgh, N. Y.
Vouchers: M. J. Donahue and E. A. Churchill.

SPANGLER, JOHN F., V.M.D.
Rt. 4, Harrisonburg, Va.
Vouchers: R. C. Snyder and T. De Mott.

SUTER, HARRY A., V.M.D.
New Enterprise, Pa.
Vouchers: E. L. Stubbs and D. K. Detweiler.

WILEY, DALE A., V.M.D.
50 West Ave., Wellsboro, Pa.
Vouchers: E. A. Churchill and T. De Mott.

WILSON, CAMERON S., V.M.D.
Richboro, Pa.
Vouchers: E. A. Churchill and T. De Mott.

ZAHN, ALAN, V.M.D.
801 21st St., Union City, N. J.
Vouchers: E. A. Churchill and J. D. Beck.

Texas A. & M. College

GENRICH, MAINARD E., D.V.M.
Box 991, College Station, Texas.
Vouchers: A. A. Lenert and W. W. Armistead.

Second Listing

Johnston, Robert V., D.V.M., 5130 N. Illinois St., Indianapolis, Ind.

Jones, William L., D.V.M., 206 West Shaw St., Tyler, Texas.

Matthews Jr., Mason L., D.V.M., 1431 West Magnolia, San Antonio, Texas.

Stamm, Donald D., V.M.D., New Ringgold, Pennsylvania.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. BAI are reported as of March 18, 1948, by Chief B. T. Simms.

TRANSFERS

Julius W. Amsiejus, from Mexico City, Mex., to Albuquerque, N.M.

Edmund W. Burke, from Waterloo, Iowa, to Cleveland, Ohio.

Thomas V. Coe, from Albuquerque, N. M., to Phoenix, Ariz.

Rafael Cordero, from Mexico City, Mex., to Jackson, Miss.

George C. Faun, from San Antonio, Texas, to Cleveland, Ohio.

Frank G. Hamilton, from Albuquerque, N.M., to Phoenix, Ariz.

Howard W. Johnson, from Beltsville, Md., to Washington, D. C.

Martin Kagan, from New Orleans, La., to New York, N. Y.

Harry Klauber, from Boston, Mass., to Los Angeles, Calif.

Adolph L. Linn, from Mexico City, Mex., to Richmond, Va.

Chester A. Manthei, from Beltsville, Md., to Washington, D. C.

Lawrence O. Mott, from Beltsville, Md., to Washington, D. C.

Earl B. Osborn, from Albuquerque, N. M., to Phoenix, Ariz.

William Rosner, from Baltimore, Md., to Albany, N. Y.

Claude A. Smith, from Lansing, Mich., to Olympia, Wash.

Millard M. Woods, from Cleveland, Ohio, to Waterloo, Iowa.

RESIGNED

Alvin E. Blair, Mexico City, Mex.

Edwin H. Ferrell, Atlanta, Ga.

Jean C. Flint, Mexico City, Mex.

S. Glen Miller, San Francisco, Calif.

Claude P. Murphy, Mexico City, Mex.

Lawrence W. Price, Mexico City, Mex.

Alan Ross, San Francisco, Calif.

Stanley A. Vezey, Ft. Worth, Texas.

RETIRED

Lewis Bilikam, San Francisco, Calif.

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Public Health Service Has Established Veterinary Corps.—The U. S. Public Health Service has recently established a veterinary corps. Veterinary officers who formerly held the title of scientist will now be designated as veterinarians. The grades will begin as assistant veterinarian (1st lieutenant), senior assistant veterinarian (captain), veterinarian (major), senior veterinarian (lt. colonel), and veterinarian director (full colonel). Plans are now being made to hold an examination for veterinarians in the Regular Corps of the U. S. Public Health Service. Such candidates will be picked on the basis of experience and graduate training in public health.

S/JAMES H. STEELE

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Communicable Disease Center to Analyze Blood Samples.—The laboratory division of the Communicable Disease Center will accept blood serum samples of animals which are suspected of having diseases which are communicable to man for laboratory analysis. Examples of such diseases are leptospirosis, Q fever, Rocky Mountain spotted fever, encephalomyelitis, and related diseases. It is not the intent of this laboratory service to conflict with any service offered by other laboratories. Their purpose is to determine the possible incidence of animal dis-

eases, other than brucellosis, which may be important to the health of the nation.

S/JAMES H. STEELE.

AMONG THE STATES AND PROVINCES

Arizona

Personal.—Dr. Oscar Sussman of the U. S. Public Health Service is in Arizona conducting a survey on diseases communicable from animal to man. His work includes the study of tapeworm, Q fever, and brucellosis.

California

Dr. M. A. Northrup Honored by A.A.U.—Dr. M. A. Northrup (Wash. '33), of San Francisco, was recently selected, and presented with a plaque, as the "Outstanding Athlete of the Pacific Association of the Amateur Athletic Union." Dr. Northrup won distinction as a wrestler in his college days and has continued active in that sport ever since, having been champion in the 158-lb. class of the A.A.U. on several occasions. In March of this year, he won the Far Western and the Senior Pacific A.A.U. championships and the Fifteenth District Olympic Wrestling tryouts at San Jose, thereby qualifying for the final Olympic tryouts held at Iowa State College, April 29 to May 1, 1948. He also entered the A.A.U. championships held in New York during April.

Dog Given Oxygen.—Paul Brindel, owner of Hilltop Ranch in Novato, administered oxygen to his prize Norwegian Elkhound, Maestro,

which was suffering from complications of virus pneumonia and a nervous affliction. It is believed that this is the first time a dog has been given oxygen to save its life. Maestro has won 40 ribbons in dog shows and is insured by Lloyds of London.

Colorado

Chinchilla Show.—The state branch of the National Chinchilla Breeders of America held a live chinchilla show at the Cosmopolitan Hotel in Denver on February 13-14.

Connecticut

State Association.—The annual meeting of the Connecticut Veterinary Medical Association was held at the Hotel Bond, Hartford, Feb. 4, 1948. The following officers were elected for the ensuing year: Drs. John P. McIntosh, *president*; Charles P. Hines, *first vice-president*; Raymond Larson, *second vice-president*; Ernest H. Patchen, *secretary-treasurer*. Members elected to the Board of Censors are Dr. John Knapp, *chairman*, Drs. W. B. Holcomb, G. H. Ludins, R. J. Stadler, and H. C. Raven. A Public Relations Committee was formed with Dr. R. E. Larson, *chairman*.

S/E. H. PATCHEN, *Secretary*.

Florida

Board of Health Sponsors Veterinary Program.—A full-fledged veterinary program has been started by the Florida State Board of Health under the direction of Dr. J. E. Scatterday, recently appointed as veterinary consultant. It is the first time such a project has been undertaken on a state level in Florida.

As veterinarian for the state health department, Dr. Scatterday will work toward the



Dr. John R. Mohler, acting in this instance as reporter for the JOURNAL, reports that veterinarians and their wives wintering in Florida experienced a fine second reunion where many old relationships were renewed. The picture was taken at the Essex Hotel, St. Petersburg.

(Left to right)—Drs. W. F. Biles, Frankfort, Ky.; J. H. Lenfestey, Lyons, Ohio; H. H. Fairbanks, Columbus, Ohio; C. E. Shipman, Tiffin, Ohio; J. H. Odgers, DeWitt, Iowa; H. L. Little, Columbus, Ohio; H. W. Peirce, West Medford, Mass.; Wm. Hansen, Greenwich, Mich.; J. R. Mohler, St. Petersburg, Fla., and Washington, D. C.; and Wm. Dennis, Jamestown, N. Y.

control of those diseases of animals which are communicable to man. One of his most important projects is a rabies control program.

Dr. Scatterday is a native of Columbus, Ohio, and received his degree in veterinary medicine from Ohio State University. He has worked in Florida for the past seven years.

Illinois

Spring Meeting.—The spring meeting of the Northern Illinois Veterinary Medical Association was held on March 31, 1948, at the Hotel Faust in Rockford. The following program was presented:

Dr. L. P. Doyle, associate pathologist, Department of Veterinary Science, Purdue University: "Baby Pig Diseases."

Mr. Lyman Peck, feed consultant and contributing editor of *Feedstuffs*, Chicago: "Some Observations on Livestock Feeding."

Dr. Niels Rasbeck, assistant professor of Royal Veterinary College, Copenhagen, Denmark, now counselor at the University of Illinois, Urbana: "Bovine Sterility."

Discussion by the group on "Foot-and-Mouth Disease."

Dr. J. C. Kaiser, Rockwell: "Swine Practice."

Drs. L. P. Doyle and J. C. Kaiser conducted a question box discussion on "Swine Problems."

Dr. Wade O. Brinker, assistant professor, School of Veterinary Medicine, Michigan State College, East Lansing: "The Use of Antibiotics in Small Animal Practice," and "The Use of Intramedullary Pins in the Fixturing of Fractures."

The ladies were entertained at a luncheon and cocktail hour and enjoyed the banquet with their husbands. Mr. G. E. Metzger, field secretary of I.A.A., was guest speaker at the banquet.

The film, "Valiant Years," was shown.

s/A. A. LEGNER, Secretary.

Chicago Association.—The officers for the Chicago Veterinary Medical Association were erroneously reported in the April JOURNAL. Following is the correct list of officers for 1948: Drs. W. A. Young, *president*; H. Preston Hoskins, *vice-president*; and Robert C. Glover, *secretary-treasurer*.

Chicago Virus Discussion Group Meets.—The Chicago Virus Discussion Group met at the State Department of Public Health, April 14, 1948. Drs. Emilio Weiss and F. B. Gordon discussed "Intracellular and Extracellular Forms of Viruses of the Psittacosis-Lymphogranuloma Venereum Group."

s/J. E. KEMPF, Secretary.

Federal Veterinarians Chapter Meets.—The Chicago chapter of the National Association of Federal Veterinarians met on March 22, 1948, at which time the following officers were elected: Drs. T. E. Utley, *president*; W. W. Barlow, *vice-president*; E. R. Laiho, *secretary*; and R. H. Crowell, *treasurer*.

With the exception of July and August, the organization plans to meet on the third Tuesday of each month.

s/E. R. LAIHO, Secretary.

Honor Dean Rusk.—One of the ceremonies of Farm and Home Week of the University of Illinois, February 9-13, was the unveiling of a portrait of Dean H. P. Rusk of the College of Agriculture. This year's Farm and Home Week was outstanding on account of the authentic facts related about the European agriculture-food situation by expert observers.

International Dog Show.—The annual International Dog Show held at the International Amphitheater, Union Stock Yards, Chicago, on March 27-28, attracted 1,875 entries of 90 breeds and sizable crowds.

McLean County Leads Again.—Having gained global fame in swine sanitation some twenty-five years ago, McLean County has become the first county in the state to adopt the Grade A milk ordinance on a county-wide basis. The county was also among the first to organize a County Health Department under the new national health program.

Feed from the Clouds.—Early in March, when the Pecatonica River was in flood, in the Rockford area, a horse became stranded on a small patch of high ground. When the flood subsided, it left a sheet of ice too thin to support the horse. While the animal was marooned the owner engaged an airplane to drop hay and corn at regular intervals to keep it well fed.

According to a press report (*Chicago Trib.*, March 12, 1948), the airplane-feeding method was used by other farmers in the area whose stock were similarly isolated.

Asiatic Cholera.—The flare-up of cholera in Egypt reminds the *Illinois Health Messenger* that the last epidemic of cholera in the state occurred in 1866 in Coles, Champaign, Iroquois, and Cook counties, and that the fear of cholera started the state's public health service.

No More Goltrous Dogs.—Between 1918 and 1925, I performed about 2,000 autopsies on dogs in Chicago among which the incidence of goiter was 98 per cent and that of "cancer" of the thyroid with gross pulmonary metastases, 1.6 per cent. Goiters and cancer of the thyroid completely disappeared from Chicago dogs after 1925, or one or two years after iodized salt became a general grocery store commodity.—A. C. Ivy, M.D., *Science*, Nov. 14, 1947.

Personal.—Capt. Will Judy, editor of *Dog World*, and Mrs. Judy judged at the Kennel Club, Chile, in February and at the All-Breed Show of the Ulster Fox Terrier Club at Belfast, Ireland, in March.

Indiana

Research Foundation Receives Grant.—The Purdue Research Foundation has received \$2,500 from Pitman-Moore Co. Investigations under this project will be directed by Dr. Glenn L. Jenkins, dean of the Purdue University School of Pharmacy.

Iowa

Semiannual Meeting.—The Southwestern Iowa Veterinary Medical Association met at the Hotel Rome in Omaha, Neb., April 6, 1948. The following speakers appeared on the program:

Dr. Russel Leper, Des Moines: "Small Animal Practice."

Dr. J. D. Ray, Corn States Serum Co., Omaha, Neb.: "Swine Diseases."

Dr. John R. Dick, Fort Dodge Laboratories: "Brucellosis."

Dr. J. W. Cunkelman, Fort Dodge Laboratories: "Sterility in Cattle."

The ladies were entertained at a luncheon.

s/M. R. BEEMER, *Secretary*.

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The Iowa State College Has 90th Anniversary.

—On March 22, 1948, The Iowa State College celebrated the 90th anniversary of its founding. The occasion was marked by a symposium presenting outstanding leaders in the major areas of educational and scientific activity sponsored by the institution. Among the speakers was Dr. William H. Feldman of The Mayo Foundation for Medical Education and Research, Rochester, Minn., whose subject was: "Veterinary Medicine: Guardian of Human and Animal Health." Dr. Leslie M. Hurt (ISC '04), president-elect of the AVMA, Los Angeles, Calif., spoke at the evening banquet as a representative of the alumni of the Division of Veterinary Medicine.

s/JAMES R. SAGE, *Secretary*.

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Anaplasmosis in Tama County.—An outbreak of anaplasmosis last December in a herd of Hereford feeder cattle on a farm in Tama County was reportedly spread by dehorning a month before the onset. Inasmuch as the cattle were purchased at the Kansas City Stockyards, the presumption was that some of the dehorned animals originated in Texas or Oklahoma where anaplasmosis has been known to exist and that 1 or more of the animals was apparently a carrier. Ten head died. The diagnosis made by Dr. Guy Brown of Hudson, was confirmed by Iowa State College.—*From Bio-Chemic Review, Winter, 1948.*

Kansas

"Interns" Want Summer Jobs.—Seventy men in the School of Veterinary Medicine at Kansas State College are looking for summer jobs as "interns" with established veterinary medicine doctors. R. R. Dykstra, dean of the school, has disclosed. Students are those who have finished the junior year of the school's five-year curriculum. All are requested to work under an established practitioner before being granted a degree. The school of Veterinary Medicine at Kansas State recently adopted a six-year curriculum.

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Personal.—Dr. R. R. Dykstra, dean of veterinary medicine, Kansas State College, was elected president of the Association of Veterinary Deans for the 11th consecutive year.

Louisiana

Icing Plant for Argentine Shipments.—Argentina hopes to build a \$100,000,000 refrigerating and processing plant in the foreign trade zone of New Orleans. According to the *Chicago Journal of Commerce* (Jan. 30, 1948), plans call for the project to be financed by both United States and Argentine capital, since there would be a two-way flow of traffic through the plant. It would be used primarily for refrigerating and storing meats, but other products, such as fruit and wine, also would be handled. Technicians from Argentina are expected to arrive in New Orleans soon to study the site for the plant.

A possible obstacle to the project was raised by the U. S. BAI, which said that Argentina would have to confine its meat shipments to cooked products because freezing does not destroy the foot-and-mouth disease virus.

The Chicago paper reported also that the Peron government is considering New Orleans as a terminal for its merchant fleet and for FAMA, its principal air line.

Manitoba

Annual Meeting.—The fifty-eighth annual meeting of the Manitoba Veterinary Association was held in Winnipeg, March 12, 1948. Officers elected for the year were Drs. E. L. Houck, Winnipeg, *president*; J. Arbuthnott, Portage la Prairie, *vice-president*; and J. M. Isa, Winnipeg, *secretary-treasurer* and *registrar*. The following speakers appeared on the program:

Dr. T. Childs, Ottawa: "The Cornerstone of Agriculture."

W. S. McLeod, University of Manitoba, Winnipeg: "Recent Insecticides."

Dr. Anne Laidlaw, Winnipeg: "Leptospirosis of Dogs."

Dr. A. Savage, Winnipeg: "Pathology of Leptospirosis," and "History of Veterinary Association of Manitoba."

Dr. Chamberlayne, Winnipeg: "The Recent Meat Emergency."

Dr. H. H. Ross, Brandon: "A Veterinarian Abroad."

Two movies, "Valiant Years" and "Science of Milk Production," were shown. Guest speaker at the banquet was J. H. Evans, deputy minister of agriculture.

s/J. M. Isa, *Secretary*.

Maryland

Brucellosis Epidemic.—Infected milk distributed by a local raw milk dealer caused an outbreak of 28 cases of brucellosis in Federalburg during January and February, 1946. *Brucella abortus* was isolated from only 2 patients but the others showed symptoms of the disease and had positive blood agglutination.

Due to a shortage of milk, additional milk, purchased from an uninspected source, was used only when the normal supply was short, and therefore, there was no factor of dilution to prevent the ingestion of a large number of organisms by the using parties. The herd from which the infective milk was obtained had 14 adults, 7 of which were reactors. All reactors

had high titers except 1, and there had been many abortions in the herd. This is the first large human brucellosis outbreak reported due to *Br. abortus*.—*In Public Health Rep.*, Jan. 30, 1948.

Massachusetts

State Association Meets.—The monthly meeting of the Massachusetts Veterinary Association was held March 25, at the Hotel Statler in Boston. Guest speaker was Carl W. Walter, M. D., assistant professor of surgery and director of surgical laboratories, Harvard Medical School, who spoke on "Operating Room Technique."

s/C. LAWRENCE BLAKELY, *Secretary*.

Missouri

Kansas City Association.—The regular monthly meeting of the Kansas City Veterinary Medical Association was held March 16 in the Hotel Continental. Dr. N. O. Rasbech, Royal Veterinary College, Copenhagen, Denmark, in this country as visiting lecturer and counselor at the University of Illinois, Urbana, was guest speaker. His subject was "Bovine Sterility."

The technicolor, sound film, "Ye Old and New in Medical Research," was shown through the courtesy of Allied Laboratories, Inc.

s/EARL L. MUNDELL, *Secretary*.

St. Louis Association Meets.—The St. Louis District Veterinary Medical Association met at the Ralston Purina Research Building, April 2, 1948. Speaker for the evening was Dr. A. H. Quin, head, Professional Service Division, Jenson Laboratories, Kansas City, Mo., who spoke on "Advancements in the Field of Veterinary Therapeutics and Immunology." The Public Health Committee also presented reports on leptospirosis, anaplasmosis, anthrax, equine encephalomyelitis, tularemia, milk, and undulant fever.

s/W. C. SCHOFIELD, *Secretary*.

Central Association Meets.—The Central Missouri Veterinary Medical Association met at Carrolton on Feb. 6, 1948. The following officers were elected for 1948: Drs. Wm. Johnson, Slater, *president*; W. H. Wertz, Lexington, *vice-president*; and Hardin E. Gouge, Sedalia, *secretary-treasurer*.

s/HARDIN E. GOUGE, *Secretary*.

Personal.—Dr. Joe F. Knappenberger (KSC '35) joined the staff of Ashe Lockhart, Inc., March 1. He was formerly employed by the U.S. BAI, and spent a year on the staff of the department of bacteriology, Kansas State College, Manhattan. Dr. Knappenberger has purchased a suburban farm home where he will continue his hobby of raising Hereford cattle.

Ashe Lockhart, Inc., has recently added more than 34,000 sq. ft. of floor space to their plant. This includes a number of modern laboratory rooms and provides unsurpassed facilities for the production of rabies vaccine and canine distemper products. The new facilities cost more than \$200,000.

New Hampshire

State Association Meeting.—The New Hampshire Veterinary Medical Association held an evening meeting at the Eagle Hotel in Concord, March 4. Dr. C. Thibeault of Wakefield, Mass., president of the New England Veterinary Medical Association, spoke on the training and ethics of veterinarians as affecting the veterinary profession. Mr. Perley Pitts, commissioner of agriculture made a few timely remarks.

Guest speaker of the evening was Dr. Jacques Jenny, on leave from the School of Veterinary Medicine at Zurich, Switzerland. Dr. Jenny who is spending some time at the Angell Memorial Hospital in Boston, Mass., spoke on practice, veterinary education, and production of biologic products in Switzerland.

s/FRED E. ALLEN, *Secretary*.

New Jersey

Dr. and Mrs. Maxson Killed in Plane Crash.—A private plane crashed on a fog-shrouded Pennsylvania mountain top near Somerset on the morning of March 20, causing the death of Dr. and Mrs. Wilbur B. Maxson of Flemington and six other persons, including a year-old baby. The plane was on its way to St. Louis, Mo., and was owned by friends of the Maxsons from Providence, R. I., who also died in the crash. The accident occurred about two hours after the plane had left the Westchester County (N. Y.) airport in a stretch of the Allegheny Mountains known as "Pilot's Graveyard."

Also killed were six prize dogs which were being taken to St. Louis for a dog show there. The exact cause of the crash had not been determined by investigators.—(*Trenton Times-Advertiser*, March 21, 1948.)

Drug Train for Europe.—Following the lead of Drew Pearson's "Friendship Train," the New Jersey Pharmaceutical Association has unanimously endorsed a "Drug Train for Europe" designed to provide needful drugs to aid in the rehabilitation of the war-torn countries. The plan is to have the American Pharmaceutical Association as sponsor of the movement. Already drug manufacturers have made donations toward the laudable project and the Radio Corporation of America has offered electron microscopes for use in European hospitals.

New York

City Association.—The Veterinary Medical Association of New York City held a meeting on March 3, at the Hotel Pennsylvania. Theodore Elsasser, M.D., F.A.C.S., assistant in surgery, New York University and Bellevue Hospital Medical College, spoke on "Leucemia and Cancer in Dogs."

s/C. R. SCHROEDER, *Secretary*.

Cornell Conference on Livestock Parasite Control.—This conference, held at Ithaca on Feb. 26-27, 1948, and organized by the Department of Parasitology, New York State College of Veterinary Medicine, and the Department of Entomology, Cornell University, brought together practicing veterinarians, state officials, extension men, and research workers. Eighteen

papers and three films were presented on problems concerning the use and toxicology of new insecticides, and on the control of internal and external parasites of livestock.

In regard to the chlorinated hydrocarbons, other than DDT, recently developed as insecticides, the consensus was that their use for livestock parasites has not passed the stage of experimentation, and veterinarians should be guarded in their recommendations for farm use. Tests of acute toxicity of these insecticides have shown DDT to have a ratio of 1 (L.D. 50 = 250 mg./kg. in rats) compared to which benzenehexachloride is 2, DDD 1/10th, chlordane 1/2, toxophane 4, and parathion 70.

The use of parathion on animals cannot, at present, be considered, due to its high toxicity.

A note of interest is that the chlorinated hydrocarbons such as DDT are stored in the fatty tissues of the animal, and a period of starvation will bring about absorption of a possibly harmful amount of the stored chemical. The presence of trace amounts of these chemicals in the butterfat of sprayed dairy cows also should be kept in mind, although 0.5 per cent sprays resulted in only 0.1 to 2.0 parts per million in the milk.

Apparently, it will be impossible to prepare benzenehexachloride (BHC) free of the musty odor, as even the pure isomers develop odor when stored, due to slight chemical instability.

The control of cattle lice was considered by several speakers. In field tests, both DDT and BHC give excellent control, but from the viewpoint of the field worker rotenone is still preferred because it combines high efficiency with low cost and known safety.

Horseflies (Tabanidae) were considered to be of great practical importance. Unfortunately, the new insecticides have not resulted in satisfactory control, as one acre of pasture has produced about 40,000 flies, even though only one generation per year develops in the more northerly states. Practical and long-lasting repellents, to prevent the serious loss of blood from tabanid attack on cattle, have not been developed.

In regard to dog lice it was agreed that DDT dusts were inefficient largely because the parasites were not highly susceptible to the chemical.

Sarcoptic scabies in cattle was discussed in detail. It was agreed that the practicing veterinarian holds the key to control since, sooner or later when visiting all herds, he is in a position to make a diagnosis and bring all affected herds under supervised treatment. Lime-sulfur sprays have been effective. The use of BHC is not to be encouraged for dairy herds, and for mange in other animals its future rôle is as yet undetermined.

The discussion of X disease, from the viewpoint of skin and other lesions, elicited the fact that the proliferation of the lining of the bile ducts was probably pathognomonic for this strange malady of unknown etiology. In suspected cases, an examination for ectoparasites should be made in order to eliminate that factor.

Poultry parasites present many problems. While the northern fowl mite and various lice can be kept under control by the use of nicotine

sulfate, better methods for destroying red mites (*Dermanyssus*) are needed. Worm parasites are not now of great importance, but coccidiosis of chickens and enterohepatitis of turkeys are major hazards to the industry. While coccidiosis is being controlled by sanitation and the careful use of sulfonamides, there is as yet no satisfactory treatment for enterohepatitis. However, 1 oz. of sulfaquinoxaline per 200 lb. of mash, fed continuously, apparently reduced mortality from enterohepatitis in turkey poults by about 66 per cent in two tests.

Control of warble flies remains a problem of extension; no new larvicides have been developed, and the routine powders are still standard. The work of 68, 4-H clubs in treating 47,000 head of cattle, and thereby reducing the incidence of grubs in the treated herds by more than 60 per cent in two years, was an interesting project in New York State.

The control of diseases caused by worm parasites presented several problems. The need of bringing the use of anthelmintic drugs into correct perspective, and the necessity of more research work to elucidate the rôles of environment, nutrition, and other predisposing factors in diseases caused by parasites that are normally not highly pathogenic, were stressed. The use of phenothiazine-salt mixtures as a sole measure of control for parasitic diseases of sheep was opposed; individual treatment of sheep has been shown to be more effective in the northern states and Canada.

Sodium flouride as an anthelmintic for swine will no doubt play an important part, but as a sole measure for controlling ascariasis will have little value. Lead arsenate for tapeworms of sheep should be used cautiously and only after it has been determined that *Moniezia* is actually pathogenic in any region; its use in combination with phenothiazine might entail danger of serious toxic effects.

The meetings ended with an appeal for the close coöperation of veterinarians, research workers, and extension men in determining more efficient means of combatting losses from livestock parasites.

S/W. E. SWALES, *Chairman,*
AVMA Committee on Parasitology.

Grant Made for Medical Research.—A grant of \$2,000 was made to the Committee for the Promotion of Medical Research, Inc., New York City by Pitman-Moore Co. Dr. Robert C. Batterman, M.D., will supervise the work under this grant.

Ohio

Conference Program Planned.—The annual conference for veterinarians of the College of Veterinary Medicine, Ohio State University, is to be held June 16-18. One day will be devoted to swine nutrition. The material presented will be of such a nature that it can be applied by the veterinarian in everyday practice. Those in attendance will receive mimeographed material to be used for future reference. Dr. R. E. Rebrassier is chairman of the general conference committee.

S/WALTER R. KRILL.

Meeting in Cleveland.—The Cuyahoga County Veterinary Medical Association assembled for a dinner meeting on the evening of March 24, 1948. The guest speaker was Dr. H. O. von Rosenberg (TEX '20) of Parke-Davis & Co. who delivered an illustrated talk on "Sex Hormones."

s/H. B. ROBERTS.

William A. Starin to Retire.—Professor William A. Starin, of the Department of Bacteriology, The Ohio State University, will retire from active service at the end of this academic year after thirty-eight years of teaching at the University. He is known for his work on filterable viruses, pathogenic fungi, and especially in the field of immunology and pathogenic bacteriology. Plans are being made by friends and former students to honor him on the occasion of his retirement. A dinner in his honor is arranged for Saturday, May 8, at the Neil House in Columbus, and all friends and former students who can do so are invited to attend. Definite reservations must be made by May 1.

The William A. Starin Lectureship has been established through The Ohio State University Development Fund and will be administered by the Department of Bacteriology in consultation with the dean of the graduate school. All of Professor Starin's friends and former students are being asked to send such contributions as they desire for this fund. Checks should be made payable to The Ohio State University Development Fund.

Checks for the Lectureship, reservations for the dinner, and requests for further information should be sent to Dr. Margaret D. Heise, Department of Bacteriology, Pharmacy and Bacteriology Bldg., The Ohio State University, Columbus 10, Ohio.

s/MARIAN ESTEP.

Ohio Fraternity Meets.—The Delta chapter of Phi Zeta, national veterinary honorary society, held its annual initiation and banquet at The Ohio State University on March 3. Dr. John H. Helwig, president of the chapter, formally initiated the new members: Drs. F. Noyan, A. Noyan, and C. Clark; Seniors R. F. Koustmer, N. B. King, J. P. Check, H. L. Easterbrooks, and C. J. York; Juniors E. F. Donovan, T. A. Bragg, T. F. Zweigart, P. L. Holden, V. J. Yates, L. D. Kintner, and D. Eglit. New officers for the coming year are: Dr. Fred J. Kingma, *president*; Mr. Edward F. Donovan, *vice-president*; and Dr. Charles R. Smith, *secretary-treasurer*.

After the banquet and initiation, Dean Paul Hudson of the Graduate School addressed the members of Phi Zeta and the AVMA student chapter at a joint meeting.

s/F. R. KOUTZ, *Secretary*.

Ontario

College to Open New Wing.—The new west wing of the Ontario Veterinary College will be opened officially on July 6, 1948, and is to be the occasion of a special celebration. Graduates of the Ontario Veterinary College and all other interested veterinarians are invited to attend.

A refresher course will be held at the College, July 5-9, 1948. The course has been arranged to appeal to those engaged in laboratory work as well as those in the clinical field. The pro-

gram consists of sections on poultry, fur-bearing animals, veterinary public health work, etc., and both large and small animal clinics. A program has also been planned for the wives and children of veterinarians who wish to come to Guelph.

The residences at the Ontario Agricultural College will be open during the week of the course and graduates of the Ontario Veterinary College, as well as other visitors to the conference, may have residence accommodations on the campus. The program and further information about residence charge will appear in the June JOURNAL.

For further information write to Ontario Veterinary College, Guelph, Canada.

s/A. L. MACNABB, *Principal*.

Ontario Chapter.—At the January 12 meeting Dr. Black spoke on his experiences in the cattle ranching areas of British Guiana where he spent five years. He stressed the problem of nutrition, as the soils there are extremely deficient in calcium and phosphorus. For this reason the cattle mature late, show poor gains, and have low fertility.

At the February 2 meeting the films, "Infectious Anemia," "Effective Use of the Stader Splint," "No Hand Stripping," and "Gastric Ulcers in the Human Being," were shown.

s/GEOFFREY LORD, *Secretary*.

Pennsylvania

Keystone Association.—The Keystone Veterinary Medical Association sponsored the second in a series of lectures open to the public on March 24, 1948, at the University of Pennsylvania, School of Veterinary Medicine. Speaker for the evening was Dean R. A. Kelsner, School of Veterinary Medicine, University of Pennsylvania, who spoke on "What the Veterinary Profession Means to Mankind." The motion picture, "Valiant Years," was shown and the veterinary buildings were open for inspection.

s/RAYMOND C. SNYDER, *Secretary*.

Northeastern Association.—The Northeastern Pennsylvania Veterinary Medical Association elected the following officers at their meeting on Feb. 25, 1948. Drs. J. H. Tower, Clarks Green, *president*; M. F. Miller, Montrose, *vice-president*; C. J. Hollister, Montrose, *secretary-treasurer*; and H. W. Barnes, Thompson, *trustee* to the state association.

s/RAYMOND C. SNYDER, *Secretary*.

City Association.—At a dinner meeting on Jan. 27, 1948, the Capitol City Veterinary Medical Association elected the following officers: Drs. W. F. Hoffman, Harrisburg, *president*; H. C. Kutz, Harrisburg, *secretary-treasurer*; and W. H. Martindale, Harrisburg, *trustee* to the state association.

s/RAYMOND C. SNYDER, *Secretary*.

Personal.—Dr. H. B. Roshon, Reading city food inspector, has been named chairman of the draft horse department at the Reading Fair. Dr. Roshon has been active in the fair since 1915 and has been the chief veterinarian of the fair for a number of years.

Quebec

Andrew Smith Portrait Fund.—The alumni of the Ontario Veterinary College are planning to unveil a new portrait of Professor Andrew Smith at the dedication of the new wing to the college at Guelph, July 6. Dr. Chas. A. Mitchell, dominion animal pathologist, Animal Disease Research Institute, Hull, Quebec, announces that graduates of the O.V.C. are invited to contribute to the cost of the painting, recalling in doing so that they are paying tribute not only to their distinguished alma mater but also to the founder of formal veterinary education in North America. Send your contribution to Dr. Mitchell or to the *Canadian Journal of Comparative Medicine and Veterinary Science*, Gardenvale, Quebec.

Texas

State Association Meets.—The winter meeting of the State Veterinary Medical Association of Texas was held in San Antonio Jan. 19-20, 1948. New officers elected at this time were: Drs. D. C. Frederick, Houston, *president*; R. A. Culpepper, San Antonio, *president-elect*; Ty Hardy, Sonora, *first vice-president*; I. B. Boughton, Sonora, *second vice-president*; C. C. Young, Nacogdoches, *third vice-president*; E. W. Wupfeman, Austin, *treasurer*; and E. A. Grist, College Station, *executive secretary*.

S/E. A. GRIST, *Secretary*.

Cattlemen Oppose Foot-and-Mouth Disease Research.—President C. E. Weymouth of the Texas and Southwestern Cattle Raisers Association announced (*The Cattleman*, Feb., 1948) that the executive committee of that organization is unanimously opposed to the establishment of a laboratory in the United States for conducting research on foot-and-mouth disease and that he has notified Congressman George W. Gillie to that effect. Congressman Gillie is chairman of a committee on agriculture of the House of Representatives.

Foot-and-Mouth Disease.—The state legislature in January, 1947, appropriated \$150,000 for manpower and equipment to be used in preventing the movement of livestock and disease-carrying materials across the Mexican border. This important task is conducted largely under the management of State Veterinarian T. O. Booth and Director J. H. Rasco of the Livestock Sanitary Board.

Some Ticks Remain.—The Livestock Sanitary Commission's report for the fiscal year ending in August, 1947, shows that the cattle tick is still a threat to the cattle industry of the South. At the end of the year, 106 herds containing 2,204 head in nine counties were under quarantine, and there is a narrow strip just north of the Rio Grande that is held under blanket quarantine by federal and state authorities. Moreover, on various occasions tick-infested stock originating in Mexico were apprehended in the border counties.

Personal.—Dr. E. A. Grist (Tex. '37) has been appointed special representative of Fort

Dodge Laboratories, Inc., for the southwestern territory. Dr. Grist, formerly Texas State Veterinarian (1943-45), has been extension veterinarian at Texas A. & M. College for the past three years. He is secretary of the Texas State Veterinary Medical Association and editor of the monthly *Texas Veterinary Bulletin*.

Virginia

Personal.—Dr. W. F. Jackson (MSC '47) has moved from 3612 Lee St., Shaker Heights, Ohio, to 116 Reservoir Ave., Harrisonburg, Va.

Washington

Personal.—Dr. John R. Gorham (WASH '46) joined the staff of the College of Veterinary Medicine as assistant professor of pathology effective March 1, 1948. Dr. Gorham was previously with the Fur Animal Disease Station in Pullman.

Wisconsin

Guernsey Breeder Convicted of Fraud.—Homer F. Rundell, operator of the Linwood Farm at Livingston, was sentenced to one year and a day in a federal penitentiary for sending false certificates of registration through the U. S. mails. The indictment, to which the defendant pleaded guilty, charged Rundell with selling grade Guernseys for purebreds. The fraud was committed on more than 100 buyers in 17 states and Canada.—*From Guernsey Breeders' Journal*, January, 1948.

Wyoming

Famed Hereford Bull Dies.—A heart ailment of long duration, coupled with liver damage and other complications, brought an untimely end on Jan. 13, 1948, to 5-year-old WHR Helmsman 3d, one of the famed bulls of the Wyoming Hereford Ranch in Cheyenne. In his showyard prime, he was regarded as a near model of Hereford masculinity, and an offer of \$100,000 for him was once refused by WHR Manager R. W. Lazear. The wisdom of Lazear's decision was later attested by the fact that this bull's first 20 sons and daughters brought a total of \$103,250 at auction. In addition, many of the calves he sired, some of which have been National Western Champions, are still at the Ranch. WHR Helmsman 3d, himself, was the 1945 National Western champion bull.

Dr. H. E. Kingman, Sr., WHR veterinarian, said that penicillin, sulfonamides, and blood transfusions were used without success in an effort to save the animal. Postmortem examination disclosed that the liver was twice its normal size, with extensive fatty degeneration.

Parasites a Growing Problem.—Ralph Honess, parasitologist at the Wyoming experiment station, Laramie, says that 41 species of parasites are now known to have become established among sheep and cattle in the Rocky Mountains, and the parasite problem seems to be getting more acute all the time. Seventeen of these species affect cattle only, 23 affect sheep only, and 1 is common to both cattle and sheep.—*Am. Hereford J.*, Nov. 15, 1947.

FOREIGN

Argentina

Foot-and-Mouth Disease Vaccines.—The Argentine Ministry of Agriculture has announced that effective July 1, 1948, vaccines claimed to control or prevent foot-and-mouth disease may not be advertised or sold without first being tested and approved by government scientists. —*Aberdeen-Angus J., Jan., 1948.*

Universities Enslaved.—"The Enslavement of the Argentine University" is the title of a 64-page pamphlet received from Buenos Aires by the American Society of Scientific Workers. It asserts that the universities have been muzzled by political intervention and now lack the urge for research, respect for freedom, and moral courage. The release affirms that education is in the process of transformation from democratic to a purely totalitarian status. —*Science, Feb. 13, 1948.*

Ceylon

Divided Authority Hampers Rabies Control.—Apathy of government leaders toward the need for rabies control measures, coupled with "divided authority" that prevents a unified approach to the problem, were cited by *The Times of Ceylon* (Aug. 27, 1947) as the main reasons for a mounting rabies toll. In a front page article quoting Mr. H. C. Perera of the Ceylon Veterinary Association, the *Times* said compulsory vaccination of dogs would reduce the incidence of rabies greatly. A newly amended ordinance gives local officials full authority to make vaccination mandatory, but they have done nothing about enforcing it.

Another hampering factor is that four separate government departments are responsible for the various phases of rabies control, but they work independently of each other and have made no move to coordinate their activities. The medical department concerns itself only with human cases and the police department is charged with shooting rabid dogs, while the municipal and national government veterinary departments are stymied in a wedge between those agencies.

China

New School Established.—A new school of Veterinary Medicine has been established in Lanchow, China. Dr. T. S. Sheng is dean of the new school which will be known as the National Veterinary College.

S/YEN-SHYONG LIAO.

The Chickens of China.—Phillip, Johnson, and Moyer, of the USD (*World's Poult. Sci. J.*, Oct.-Dec., 1947), describe the heterogeneous types of Chinese chicken which, prior to China's war with Japan, were the source of the sizable tonnage of dried eggs exported to the U.S.A. With the rare exception of a distinct type or two, the chickens of the Chinese are nonde-

script: large and small, feathered and clean legged, crested and noncrested, of varicolored plumage, and varied sorts of combs. One distinct type is the Yuchi, or oil chicken, which weighs up to 6 catties (9 lb.) and lays up to 200 eggs a year with an average of 110. The eggs average 80 Gm. (2.6 oz.) in weight. On the whole, the Chinese farmer has barely been able to raise chickens that lay an average of more than 50 to 70 eggs a year.

The housing varies from nothing at all to small bamboo baskets inverted over the chickens to confine them for the night. In one province (Hopei), the coops are adobe houses 3 ft. by 3 ft. by 3 ft., fitted with poles for roosts. These lack ventilation and means of cleaning out the droppings. In some sections, chickens have free range day and night, roosting where they like.

The chief feed is whatever they can forage off the farm, and table scraps. Breeding is catch-as-catch can—a true case of nature taking its course. Only a few institutions strive to improve types and that in but a small way. All appear to make the mistake of selling the large eggs and reserving the small ones for hatching.

Eggs and live or dressed poultry are sold direct to consumers by the farmers on market days or to retailers who supply the consumer.

Cuba

Colegio Médico Veterinario.—The Colegio Médico Veterinario of Cuba, now an affiliate of the AVMA, is a growing professional association, anxious to keep up with the scientific and ethical standards achieved by the leading countries of the world. Officers of this association are: Dr. Oscar Oritz Arrufat, *president*; Dr. Angel Morales, *secretary-treasurer*; and Dr. Mario Stincer, *delegate* to the House of Representatives.

S/ANGEL M. MORALES, *Secretary.*

Egypt

Cholera Epidemic.—The cholera outbreak which started in a small isolated village in September, 1947, developed an incidence of 20,000 cases with 7,000 deaths in seven weeks. The primitive water supply, deficient sanitation, noncooperation of the population, and the socio-economic conditions, made control difficult. The importance of the epidemic, according to the guardians of world health, is that it has shown up the potentiality of *Vibrio cholerae asiaticae* in a manifestly impressive fashion.

England

Veterinary Schools in the United Kingdom.—The course of training in veterinary medicine in England lasts five years, and leads to the diploma of the Royal College of Veterinary Surgeons (M.R.C.V.S.). The Royal College of Veterinary Surgeons, 9/10, Red Lion Square, London, W.C.1, is the governing and examining body of the profession in Britain, and no one may practice veterinary medicine or surgery unless he holds the M.R.C.V.S. Schools which

offer courses qualifying for the M.R.C.V.S. are:

- a) The Royal Veterinary College and Hospital, Camden Town, London, N.W.1.
- b) The Royal (Dick) Veterinary College, Summerhall, Edinburgh 9, Scotland.
- c) The Glasgow Veterinary College, 83 Buccleuch Street, Glasgow, C.3, Scotland.
- d) The Veterinary School of the University of Liverpool, Liverpool, Lancashire, England.

Degrees.—Students at the Royal Veterinary College, London, and the Royal (Dick) Veterinary College, Edinburgh, are eligible to take the examinations for the degree of B.Sc. in veterinary science of the University of London and Edinburgh respectively, as internal candidates. Students at the Liverpool School of Veterinary Science may take the examinations for the degree of B.V.Sc. as internal students of the University of Liverpool. Students at the Glasgow Veterinary College may take the examinations for the degree of B.Sc. in veterinary science of the University of London as external students. The course of training for these degrees runs concurrently with the course for the diploma of M.R.C.V.S., but an extra year may be required to complete the course.

Entrance Requirements.—The intending student should first apply to the secretary, The Royal College of Veterinary Surgeons, 9/10 Red Lion Square, London, W.C.1, for registration as a veterinary student, before he can commence his studies. It is required that he should have passed the matriculation examination or some equivalent examination that entitles him to admission to a British university. Separate application to one of the recognized schools must be made direct to the school authorities.

M.R.C.V.S. Examination Requirements.—The subjects for examination for each of the five years of the course are:

First year—chemistry; physics; biology (botany and zoölogy).

Second year—physiology; biochemistry; histology; embryology and animal management. (A special examination in animal management must be passed before the third year's examination.)

Third year—anatomy of domesticated animals; pharmacology and therapeutics; toxicology; practical pharmacy; veterinary hygiene; dietetics and animal husbandry.

Fourth year—veterinary pathology; methods of clinical pathology; veterinary parasitology.

Fifth year—The principles and practice of veterinary medicine (including special therapeutics, meat inspection, and jurisprudence); the principles and practice of veterinary surgery (including surgical and applied anatomy, operative surgery, obstetrics, and jurisprudence).

It is also necessary for a student to have at least six months' practical work with an approved instructor, but this is usually arranged for during vacations, and thus is not additional to the course.

Cost of Training.—The total approximate cost of training for the diploma course is £300

(£1,200), and for the combined diploma and degree course £320 (£1,280), but the cost at some of the schools is lower. This does not cover living expenses.

Scholarships.—Very few scholarships are available to overseas students for study at British veterinary schools. Application for them should be made to the schools direct.

Postgraduate Work.—Details of the postgraduate diplomas may be obtained from the Royal College of Veterinary Surgeons, 9/10 Red Lion Square, London, W.C.1.

France

Mediterranean Fever Well Named.—Chief Ramon of the research center on undulant fever at Montpellier and Director Lafenetre of the veterinary service of the Department of Hérault, longtime connoisseurs of brucellosis at its source (*Rev. de Path. Comp.* Nov.-Dec., 1947) declare that Mediterranean fever is well named. In their perspective (southern France), the disease has become a major menace to the population, fanned as it has been with undernourishment and, owing to the shortage of cows, to the extensive use of goats' milk in family circles.

Seldom are children under 14 stricken. The incidence is highest at the ages of 15 to 50. Herders, breeders, farmers, abattoir workers, stockcar cleaners, and handlers of manure all along the coastal area are the common victims. On certain farms, dogs, chickens, and rabbits are affected and they transmit the infection to their keepers. Undulant fever attacks men twice as frequently as women. Many of the cases are never recorded. An incidence of 71 cases in a village of 1,500 is cited as an example, since only 30 of them were officially reported. Many of the benign cases are not even recognized because the manifestations are so varied that the sick themselves may not be aware of the nature of their passing ailment.

Massive infection and low resistance account for the recrudescence in both man and animals. Chemotherapy is ineffective and vaccinotherapy, though promising, is still in the experimental stage. An energetic program for the eradication of the disease in goats is the sole hope in sight. Brucellosis of cattle and sheep is of minor importance from the epidemiological standpoint.

Guatemala

Personal.—Emilio Estrada (MVC '44) is engaged in practice in Guatemala City. He has written some interesting case reports which are being published in the JOURNAL.

Holland

Swine Brucellosis.—J. Van der Hoeden (*abstr. Rev. Path. Comp.*, Nov.-Dec., 1947) doubts very much that porcine brucellosis exists in Holland. Of 87 specimens of *Brucella* isolated from man and animals, the porcine variety was never identified, and out of 486 serologic tests in swine only 16 were positive and these only in the highest titers. The conclusion was that if brucellosis exists in the swine of Holland, it

most certainly does not have any clinical manifestations.

India

Cattle Feeds from Wood and Farm Wastes.

—The pressing problem of more food brought action from the Indian Science Congress held at Patna which was attended by scientists from all parts of India. The need for a 30 per cent increase in food production was the objective. Improved methods of farming, the processing of the cellulose of wood and of farm wastes as was done successfully in Sweden and Switzerland during the war, and artificial insemination of farm animals with the object of improving breeds of beef and dairy cattle were the subjects discussed by the veterinary section of the Congress. Opposition to artificial insemination was met because of Mahatma Gandhi's pronouncement against that procedure in cows.

Italy

Artificial Insemination Experiment.—In various Italian provinces during January, 1948, more than 20 calves were dropped as a result of artificial insemination of the dams with semen of bulls at the New Jersey Experiment Station, Sussex. The semen had been shipped by air. This experiment, the first to be carried out in Italy, had been made possible through UNRRA cooperation with Professor Malterre and Prof. T. Bonadonna, director of the Italian experiment station, Lazzaro Spallanzani. Professor Bonadonna supervised the experiment.

All of the births were normal and the calves are healthy and vigorous. A second experiment from semen transported by air from America is in process, and a third one is scheduled later this year.

Korea

U. S. Army War Dogs.—The American Army of Occupation continues to utilize war dogs in its peacetime pursuit. It has nearly 200 German Shepherds in its organization, using them to curtail the thievery which has become widespread among the civilian population since the occupying forces were cut down below the level of an efficient police service. Officers of the various ranks and many of the enlisted men are allotted canine aides to make up for the manpower shortage.

Norway

Compulsory BCG Vaccination.—In December, 1947, the Norwegian *Storting* passed a law for compulsory vaccination against tuberculosis, on the cumulative evidence of health authorities over a score of years.

STATE BOARD EXAMINATIONS

Florida—The Florida State Board of Veterinary Examiners will hold examinations on June 28-30, 1948, at the Seminole Hotel in Jacksonville, Fla. Dr. H. C. Nichols, Ocala, Fla., secretary.

Massachusetts—The Massachusetts State Board of Registration in Veterinary Medicine will hold examinations for registration in this state on June 17-19, 1948, at Amherst, Mass. The latest date for filing applications is June 1, 1948. Address inquiries to Dr. B. S. Killian, secretary, Board of Registration in Veterinary Medicine, Room 413-N State House, Boston 33, Massachusetts.

Minnesota—The Minnesota State Veterinary Examining Board will hold examinations at the State Capitol, Saint Paul, Minn., July 13-14, 1948. Dr. D. B. Palmer Wayzata, Minn., executive secretary.

Oklahoma—The State Board of Veterinary Medical Examiners of Oklahoma will conduct examinations June 16, 1948, at Oklahoma A. & M. College, Stillwater, at 9 a. m. Applications should be submitted to Dr. N. L. Astle, secretary, Oklahoma Board of Veterinary Medical Examiners, Blackwell, Okla., before that date. All reciprocity applicants must appear in person before the board.

COMING MEETINGS

Central Missouri Veterinary Medical Association. Booneville, May 7, 1948. Hardin E. Gouge, Sedalia, secretary-treasurer.

Society of American Bacteriologists. Annual meeting, Nicollet Hotel, Minneapolis, Minn., May 10-14, 1948. William McLimans, 215, Millard Hall, University of Minneapolis, Minneapolis 14, Minn., chairman.

Fourth International Congresses on Tropical Medicine and Malaria. Washington, D. C., May 10-18, 1948. Dr. Wilbur A. Sawyer, Department of State, Washington 25, D. C., executive secretary, Organizing Committee.

Michiana Veterinary Medical Association. Spring clinic. Sale barn, Wakarusa, Ind. May 25, 1 p.m. Dr. W. G. Magrane, Mishawaka, Ind., public relations.

Eastern Iowa Veterinary Association. Annual practitioners' clinic. Dairy Cattle Congress grounds, Waterloo, Iowa. May 27, 1948. Laurence P. Scott, Waterloo, Iowa, secretary.

Alabama Veterinary Medical Association. Annual conference. Auburn, Ala. June 9-11, 1948. R. S. Sugg, 408 W. Magnolia St., Auburn, Ala., state veterinarian.

Oklahoma Veterinary Medical Association. Summer meeting. Campus of Oklahoma A. & M. College, Stillwater. June 14-15, 1948. Lewis H. Moe, 408 Life Sciences Bldg., secretary.

North Dakota Veterinary Medical Association. Hotel Clarence Parker, Minot, N. Dak., June 14-15, 1948. F. M. Bolin, North Dakota Agricultural College, College Station, Fargo, N. Dak., secretary.

American Dairy Science Association. University of Georgia, Athens, Ga., June 14-16, 1948. R. B. Stoltz, Ohio State University, Columbus 10, Ohio, secretary.

- Ohio State University. Annual conference for veterinarians of the College of Veterinary Medicine. Ohio State University, Columbus, Ohio. June 16-18, 1948. Walter R. Krill, dean.
- Michigan State Veterinary Medical Association. Annual meeting. Michigan State College, East Lansing, Mich., June 17-18, 1948. B. J. Killham, Michigan State College, East Lansing, Mich., secretary.
- Texas A. & M. College conference for veterinarians. School of Veterinary Medicine, A. & M. College of Texas, College Station. June 17-18, 1948. R. D. Turk, chairman.
- California State Veterinary Medical Association. Annual meeting. Anderson Hotel, San Luis Obispo, June 19, 1948. Charles Travers, 16th and Mission Sts., San Francisco 3, executive secretary.
- American Society for the Study of Sterility. Annual meeting. Congress Hotel, Chicago, Ill., June 21-22, 1948. John O. Haman, 490 Post Street, San Francisco 2, Calif., secretary.
- Washington, State College of. Conference for Veterinarians. College of Veterinary Medicine, Pullman, June 21-23, 1948. Dr. R. E. Nichols, dean.
- Maryland State Veterinary Medical Association. Annual meeting. Hotel George Washington, Ocean City, Md. June 25-26, 1948. J. Walter Hastings, Sr., Cambridge, Md., secretary.
- Midwest Veterinary Conference, sponsored by Kansas and Missouri State Medical Associations, Municipal Auditorium, Kansas City, June 29-July 1, 1948. Dr. G. L. Dunlap, 800 Woodweather Road, Kansas City, Mo., chairman.
- North Carolina State Veterinary Medical Association, Annual Meeting. State College, Raleigh, N. C. June 29-30, 1948. Dr. J. H. Brown Tarboro, N. C., secretary-treasurer.
- Kentucky Veterinary Medical Association, Louisville, Ky., July 14-15, 1948. T. P. Strittmatter, Jr., 1034 Monmouth St., Newport, Ky., secretary-treasurer.
- American Veterinary Medical Association. Palace Hotel, San Francisco, Calif., Aug. 16-19, 1948. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.
- American Association for the Advancement of Science. Centennial Meeting, Washington, D. C., Sept. 13-17, 1948. J. M. Hutzler, 1515 Massachusetts Ave., N.W., Washington 5, D. C., assistant administrative secretary.
- Purdue University. Annual Short Course for Veterinarians. Purdue University, Lafayette, Ind., Oct. 6-8, 1948. C. R. Donham, Department of Veterinary Science, Purdue University, head.
- Eastern Iowa Veterinary Association. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa. Oct. 14-15, 1948. Laurence P. Scott, Waterloo, Iowa, secretary.
- Executive Board of the American Public Health Association. Annual meeting at Boston, Mass., Nov. 8-12, 1948. Dr. Reginald M. Atwater, 1790 Broadway, New York 19, N. Y., executive secretary.
- Illinois State Veterinary Medical Association. Annual meeting. Abraham Lincoln Hotel, Springfield, Ill., Jan. 26-28, 1949. A. G. Misener, 6448 N. Clark St., Chicago 26, Ill., secretary.
- Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.
- Houston Veterinary Medical Association, Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.
- Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.
- Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.
- New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.
- Saint Louis District Meetings. Roosevelt Hotel, St. Louis, Mo., the first Friday of February, April, June and November, W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Foreign Congresses

- First International Congress of Physiology and Pathology of Animal Reproduction and Artificial Insemination. Milan, June 23-30, 1948. Prof. Telesforo Bonadonna, Via Fratelli Bronzetti 17, Milan, Italy, secretary-general.
- International Congress of Genetics. Stockholm, July 7-14, 1948.
- International Congress of Zoölogy. Paris, July 21-27, 1948.
- World's Poultry Congress. Copenhagen, Denmark, Aug. 20-25, 1948. Secretariat General, Axelborg, Copenhagen 5, Denmark.
- National Veterinary Medical Association of Great Britain and Ireland. Southport, England. Sept. 8-15, 1948. F. Knight, 36, Gordon Sq., London, W. C. 1, general secretary.

VETERINARY MILITARY SERVICE

"Competitive Tour" Commissions an Advantage to Veterinary Corps.—Notwithstanding that the Officer Personnel Act specifically provides for a minimum starting grade of second lieutenant in the Veterinary Corps of the Regular Army, in contrast to a minimum starting

grade of first lieutenant in the Medical Corps and Dental Corps, qualified observers of military procedure say there is no immediate possibility that any veterinarian will be commissioned in the Regular Army below the grade of first lieutenant.

That portion of the Act applying to Regular Army veterinary appointments,* earlier regarded as a hard-and-fast rule that would stigmatize the Army veterinarian, is, in actual operation under administrative directives, not impairing the standing of the Veterinary Corps to any noticeable extent, nor is it likely to do so in the immediate future.

For the present, a veterinarian applying for appointment in the Regular Army must serve a one-year "competitive tour of duty." This means that the applicant will be under observation by superior officers for one year and that if his performance of duty measures up to the standard expected, he can qualify for a Regular Army commission. Whether or not he is appointed after so qualifying depends upon whether or not there is a vacancy in the authorized strength of the Corps.

While on this one-year competitive tour, the applicant is automatically fulfilling a requirement of the Officer Personnel Act that Veterinary Corps officers must have one year of active federal service subsequent to Dec. 31, 1947, in order to be appointed to the grade of first lieutenant in the Regular Army. (Without this year of active duty credit, officers would have to be appointed as second lieutenants.) In the event that the applicant has five years of active duty after 31 Dec., 1947, at the time of qualifying for Regular Army appointment, he can be appointed in the starting grade of captain.

Although this procedure temporarily eliminates the chance that there will be second lieutenants in the Regular Army, it does not preclude the chance that there will be second lieutenants on competitive tour. Assuming that a person just graduating from veterinary college wishes to enter the military service, he must apply for a commission in the Veterinary Corps Reserve as a second lieutenant and, if accepted, can go on competitive tour to qualify for a Regular Army commission. Until one year from the date that he graduated he will be in the grade of second lieutenant. Any veterinarian who served under a temporary commission during the war period and not now on active duty, and who now holds or applies for and receives a commission in the Reserve, may apply for and be recalled to active duty in the grade held by him prior to processing for separation. He may then, or thereafter, apply for entry on a competitive tour with a view to appointment in the Regular Army Veterinary Corps provided the date of his recall to active duty was prior to his thirty-second birthday. Similarly, any officer still on active duty under a temporary commission and who was on active duty on 1 Jan., 1948, may apply for a competitive tour provided he had not reached his thirty-second birthday prior to 1 Jan., 1948.

Some observers have expressed the opinion that, because new commissions in the Regular Army are unlikely to be issued below the grade

of first lieutenant for some time to come, it may not be timely to press congressional leaders to reconsider giving Veterinary Corps officers a service standing equitable to that now provided by the Officer Personnel Act for Medical and Dental officers. On the other hand, there are many who feel that the AVMA and other leading elements of the profession should begin now to exert measured but persistent pressure to obtain more favorable legislation for the veterinary military branch.

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The Future of Military Veterinary Medicine.

—Speaking before the Association of Military Surgeons of the United States (Boston, Nov. 13-14, 1947), Colonel W. O. Kester, of the Army Veterinary Corps, said that the following factors will influence future operations of the Army veterinary service:

- 1) New developments in atomic, Arctic, aerial, and other entities of global warfare.
- 2) Recent changes in the organization of the armed forces.
- 3) Diminished use of animals by the Army.
- 4) Added emphasis on food inspection because of world food shortages and trends within our army.
- 5) Military government demands for veterinary service in occupied countries.

Colonel Kester pointed out that although present military plans do not call for the use of mounted troops or pack units, future emergencies may again necessitate their use.

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Army Veterinary History.—An Army officer in Washington whose words will be heeded for a long time to come is the man who is writing the veterinary history of World War II.

At a desk in the Veterinary Division (and sometimes in the Historical Division) of the Surgeon General's office, Major E. B. Miller, V.C., has taken over the unheralded and seemingly endless job of converting a mass of field veterinary reports into an authentic chronologue of the recent war. Others worked on it before him, and the Major himself has been laboring steadily at the job for over one and a half years, under the direction of Col. W. O. Kester.

Few peacetime military assignments have entailed as many revisions in planning (due to changing directives from "higher up"), as much good judgment and scholarship, and as much patience as this assignment given Major Miller and Colonel Kester. Once the writing of the veterinary history was estimated to require a year, then a year and a half, with later estimates going upward all the time. Now, all predictions are being withheld; nobody wants to guess any more.

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Veterinary Report of Military Government

Lt. Col. Frank A. Todd has filed a report of the Veterinary Section, Public Health Branch, Internal Affairs and Communications Division, Office of Military Government for Germany U. S. It shows the incidence of notifiable animal diseases for the U. S. Zone in detail and for the other zones of occupation in general. During the months of April, May, and June,

*See JOURNAL, Dec., 1947:541-542.

1947, there were reported in the U. S. Zone 11,092 cases of ovine scabies, 9,091 cases of fowl pest, 2,919 cases of swine erysipelas, 968 of fowl cholera, 291 of swine fever (hog cholera), 231 of equine scabies, and lesser numbers of equine infectious anemia, equine encephalomyelitis, nosematosis of bees, coital vesicular exanthema and dourine of horses, and trichomoniasis of cattle.

TABLE 1

Type of employment	Total U. S. Zone
Land official	4
Reg. bez. official	4
Kreis official	187
Slaughterhouse director	41
Meat inspector (vet.)	56
Border inspector .....	...
Livestock raising	15
Practitioner	1,285
Public laboratory	30
Private laboratory	9
University and education	12
Foreign veterinarians	54
In retirement	167
Miscellaneous occupation	55
Total veterinarians	1,919

Compiled from quarterly personnel reports of German land veterinarians. The classification is according to principal occupation; many individuals are also doing other work.

The German veterinary personnel in the U. S. Zone for this period is shown in table 1.

In addition to these licensed veterinarians there were 119 unlicensed, and 5,319 lay meat inspectors.

Woman Veterinarian Promoted.—Dr. Doreen Hatfield (WASH '44) was promoted to the rank of captain, V.C., in March, 1948. She is secretary of the Women's Veterinary Association, and is the only woman veterinarian in the army. She is also the only woman veterinarian ever to be promoted to the rank of captain.

On April 17, 1948, Captain Hatfield became



Captain Doreen Hatfield

the bride of Mr. Earle D. Lewis of Cambridge, Md.

Col. Burton A. Seeley Retired.—Col. Burton A. Seeley (ISC '08), Columbus, Ohio, has been placed on the retired list of the Army effective Feb. 29, 1948. From the time he was graduated until the organization of the Veterinary Corps in 1916, he served as veterinarian with the Quartermaster Department in the Philippines and with the Fifth Cavalry in the Punitive Expedition in Mexico. He became a colonel in November, 1935. During World War I, Colonel Seeley served as veterinarian of the Thirty-third Division and First Army Corps, and upon the formation of the Service Commands into Armies in June, 1946, he was made Army Veterinarian of the First Army.

During his service with the Second Service Command in 1945, Colonel Seeley was awarded the Legion of Merit citation. At the time of his retirement, Colonel Seeley was serving as district veterinarian of the Ohio Military District, Fort Hayes, Columbus, Ohio.

Col. Fred W. Shinn Retired.—Col. Fred W. Shinn (ISC '14), Oklahoma City, Okla., was placed on the retired list by reason of physical disability, effective Feb. 29, 1948. He was commissioned a first lieutenant in the Veterinary Corps of the Regular Army in 1920, advancing through the grades and attaining the grade of colonel in 1943.

From September, 1922, to September, 1926, Colonel Shinn was stationed in Panama and upon his return was assigned to Fort Sam Houston, Texas. He also served at various other stations in Texas, as well as at Fort F. E. Warren, Wyo.; Seattle General Depot, Seattle, Wash.; San Francisco Port of Embarkation, Fort Mason, Calif.; and Camp Polk, La. He is a graduate of the Army Veterinary School, and the postgraduate course. At the time of his retirement Colonel Shinn was on duty at Fort Sill, Okla., where he had been since Feb. 12, 1947.

Major Philip C. Manley Completes Active Duty.—Major Philip C. Manly (OSU '38), VC-Res, McConnellsville, Ohio, completed his 60-day active duty in the Veterinary Division, Surgeon General's office, Feb. 23, 1948. He assisted in the preparation of drafts and plans for presentation of all material covering the veterinary laboratory service. He helped prepare a revision of AR 40-2140, veterinary laboratory service, and the outline of TB Med 237, veterinary laboratory procedure (food analysis). In addition, Major Manly aided in the revision of WD AGO 8-215, request for laboratory analysis of foods.

MARRIAGES

On Feb. 7, 1948, Dr. W. Norman Reed, Trenton, N. J. and Dr. Phyllis Dingman, Spring Valley, N. Y., were married. Both were graduated from the School of Veterinary Medicine, University of Pennsylvania in 1939.

BIRTHS

To Dr. (WSC '39) and Mrs. Albert Goodman, 1146 No. La Brea, Hollywood 38, Calif., a daughter, Elizabeth Ann, Jan. 1, 1948.

To Dr. (MSC '38) and Mrs. Edward S. White, Wauseon, Ohio, a son, Chris J., on Jan. 5, 1948.
To Dr. (CORN '43) and Mrs. Merrill Goodman of Washingtonville, N. Y., a son, Mark Douglas, Jan. 5, 1948.

Dr. (COLO '46) and Mrs. O. R. Adams, 500 W. Laurel St., Ft. Collins, Colo., announce the birth of a daughter, Gail Susan, who arrived Jan. 18, 1948.

To Lt. (UP '46) and Mrs. Martin S. Oster, Atlantic City, N. J., a daughter, Susan Renee, on Jan. 20, 1948, at San Juan, Puerto Rico.

To Dr. (COLO '42) and Mrs. Paul R. Lanphear, Pittsfield, Ill., a daughter, Margaret Agnes, Jan. 21, 1948.

Dr. (TEX '43) and Mrs. William L. Black, Jr., Portales, N. M., announce the birth of a daughter, Cynthia Meredith, Jan. 30, 1948.

Dr. (TEX '43) and Mrs. Howard W. Dickmann, 200 E. Ste. Marie St., Perryville, Mo., announce the birth of a daughter, Janice Susan, Feb. 6, 1948.

To Dr. (WASH '42) and Mrs. Harold F. Henig, Riverside, Calif., a son, Michael Craig, Feb. 12, 1948.

Captain (COLO '42) and Mrs. Bernard H. Skold, APO 58, Paris, France, U. S. Army, announce the birth of a son, Laurence Bernard, Feb. 17, 1948.

DEATHS

G. A. Bailey (IND '17), 72, New Augusta, Ind., died on Jan. 9, 1948. He had retired from active practice some years ago.

★Harold W. Bales (KSC '09), 62, Oswego, N. Y., died March 3, 1948, of a cerebral hemorrhage. He had been for twenty-four years Oswego county veterinarian and had been a member of the AVMA since 1915.

E. F. Bradley (UP '06), 66, Marlboro, Mass., died on Jan. 14, 1948. He had been for the past ten years Inspector of Animals for Marlboro and had also served as a state race track veterinarian.

★N. T. Boen (KSC '15), 56, Harmony, Minn., died Dec. 1, 1947. He had been a member of the Minnesota Veterinary Medical Association, the Tri State Veterinary Association, Cedar Valley Veterinary Association of Iowa, and of the AVMA.

★Francis P. Burke (KSC '10), 61, Madelia, Minn., died on Dec. 19, 1947. He had practiced in Madelia for thirty-eight years and had been a member of the AVMA since 1919.

John W. Dietrich (ONT '08), 64, Ottoville, Ohio, died Dec. 24, 1947, after a prolonged illness. He had practiced in Ottoville for nearly forty years.

★C. E. Haines (KSC '15), Winfield, Kan., died on Nov. 25, 1947, after an illness of more than two years. He had been a member of the AVMA.

D. A. Hoyne (UP '18), Philadelphia, Pa., died Aug. 20, 1947.

Otto Hornlein (MC K '10), 73, Chicago, Ill., died of a heart attack, Nov. 1, 1947. He was born in Germany and came to the U. S. as a young man. He was wounded in combat in the Spanish-American War. After his graduation he entered the meat inspection service of the BAI. For several years he was assistant inspector-in-charge at Chicago. Later he served as inspector-in-charge at Austin, Minn., Indianapolis, Ind., and South St. Paul, Minn., from which position he retired in 1936.

C. N. Hutcherson (CVC '16), Windsor, Mo., died Jan. 24, 1948, as the result of injuries received in an auto accident.

L. A. Kirchgatter (KCVC '18), Grafton, Iowa, died in November, 1947.

★Wilbur B. Maxson (NY-AMER '11), 58, Flemington, N. J., died on March 20, 1948, in a private plane crash near Somerset, Pa. He was a prominent practitioner in New Jersey, having served as president and chairman of the executive board of the state veterinary association, and for a number of years as secretary of the state board of veterinary examiners. He also was a member of the advisory board to the state department of agriculture. Dr. Maxson had been an AVMA member for thirty-five years, having joined the association in 1913. Mrs. Maxson, whom he married in 1938, also died in the crash.

E. A. McAttee (KCVC '10), 67, Barry, Ill., died April 18, 1948, from a cerebral hemorrhage. He had been active in state affairs and had been assistant state veterinarian in 1933.

Valentine McLeish (MRCVS), 62, died in February, 1948, at his home in Vancouver, B. C., after a brief illness. For twenty-six years he had been associated with the Department of Agriculture in Vancouver, Winnipeg, Port Arthur, and Regina.

G. E. Melody, 57, Gettysburg, S. Dak., died in February, 1948, of a cerebral hemorrhage. He had practiced in Gettysburg for thirteen years, and was a veteran of World War I.

H. W. Miller (OSU '07), Westerville, Ohio, died Nov. 5, 1947, while working on an assignment for the Ohio Division of Animal Industry for which he was field veterinarian.

D. S. Otey, (KCVC '16), 55, Smithfield, Va., died Jan. 12, 1948.

E. W. Pierce (KSC '12), La Crosse, Kan., died Feb. 28, 1948, after an extended illness. He had retired some time ago.

★E. C. W. Schubel (USCVS '11), 66, Blissfield, Mich., died Jan. 26, 1948, from a heart attack. He served for a year as assistant secretary of the AVMA and was a past president of the Michigan State Veterinary Medical Association, and president and past secretary of the Michigan-Ohio Veterinary Medical Association. He had been a member of the AVMA since 1919.

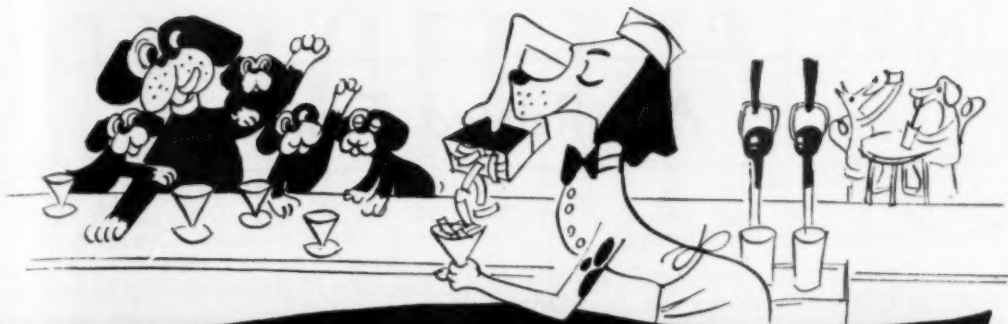
F. H. Stalnaker (ST JOS '16), Edgewood, Iowa, died at his home Jan. 20, 1948.

George P. Statter (ONT '97), Sioux City, Iowa, died on Feb. 11, 1948, according to word received in this office.

C. P. Wilson (ISC '13), Decorah, Iowa, died Jan. 13, 1948, after a prolonged illness.

E. F. Winter (IND '23), Marion, N. C., died on Dec. 5, 1947.

*Indicates member of the AVMA.



"Another Doggie's Delight," ORDERS KELLIE, OUR GRO-PUP HERO

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VETERINARY MEDICAL
AND ANIMAL HOSPITAL
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GRO-PUP
DOGS FOOD
CONTAINS ABOUT
AS MUCH FOOD
AS FIVE
1-LB. CANS

2. BALANCED BUDGET

Food for thought: many canned dog foods contain 70% water. Gro-Pup is 92% food, ... you add the moisture! A 25-oz. box of Gro-Pup supplies as much actual food, dry weight, as five 1-lb. cans of dog food.

3. ALL-OUT APPEAL

Tasty, crunchy Gro-Pup has what dogs want—and need! All-out good flavor! All-out good nutrition! Properly cooked to aid digestion of carbohydrates. Vitamin values on label are given *after cooking*. For variety, advise Gro-Pup Meal or Pel-Etts.



Made by **Kellogg's** of Battle Creek.

An' Related Topics

The Wooden Pig Still Hangs

A national drug paper¹ bent on making every druggist a veterinarian in addition to a pharmacist, has published a front page story about a pig made out of wood.

It seems that a South Dakota druggist has had a wooden pig hanging over the front of his store for fifteen years as a symbol of the veterinary products on sale. Recently, when he opened a new, ultra-modern store, the little pig was discarded. But people, used to seeing the porker, began to ask about its absence—so back went the pig. High above the entrance to the store, the pig still hangs, perhaps thinking, with its little wooden brain, how lucky it is not to be subjected to all the guesswork treatments being sold by druggists for the "care and health" of animals.

It also looks down on a troubled world of pharmacy—troubled because a lot of people are cutting into druggists' business. "Co-ops Force Drug Stores Out of Hog Serum Business" is the tear-jerking headline, two pages following the wooden pig story, that tells the sorry plight of some serum-selling drug stores. These over-the-counter protectors of animal health are informed further that "Competition from Farm Bureau coöperatives and from government agencies is forcing rural druggists in many parts of the U.S.A. to discontinue the sale of anti-hog cholera serum, virus, vaccines and bacterins."

That's just part of the sad state of pharmacy today, over which the symbolic wooden pig still hangs. To make matters worse (we read in the drug papers), hosiery shops are selling nylons that can be bought at drugstores, feed stores are selling dog food as if they had a drug counter, restaurants serve sandwiches and coffee and plate lunches in sheer disrespect for the soda fountain. Some people even go so far as to do their Christmas shopping at department stores.

Then there are veterinarians who diag-

nose livestock diseases without first giving the corner drugstore its cut.

Yep, everybody is shooting at the wooden pig as the druggist stands by, amazed and daunted by the falling splinters.

Egg Washer

A machine for washing "dirties" developed by Cornell agricultural engineers consists of a series of abrasive-coated cloth discs under which the eggs are passed by moving fingers that rotate them and supply water regulated at 165 F. The machine keeps the eggs turning and cleans them in twenty-two seconds. The cost is low enough to suit the 500-hen farm.

Better than a washer, however, is producing eggs that don't need washing. Washing a fecal-soiled egg may please the eye but whether harmful elements are washed into or off of it is the sanitary question. It reminds the surgeon of the perfunctory washing of a surgical site.



Wear a V.F.W. "Buddy Poppy" Memorial Day.

¹Drug topics, Dec. 27, 1947.

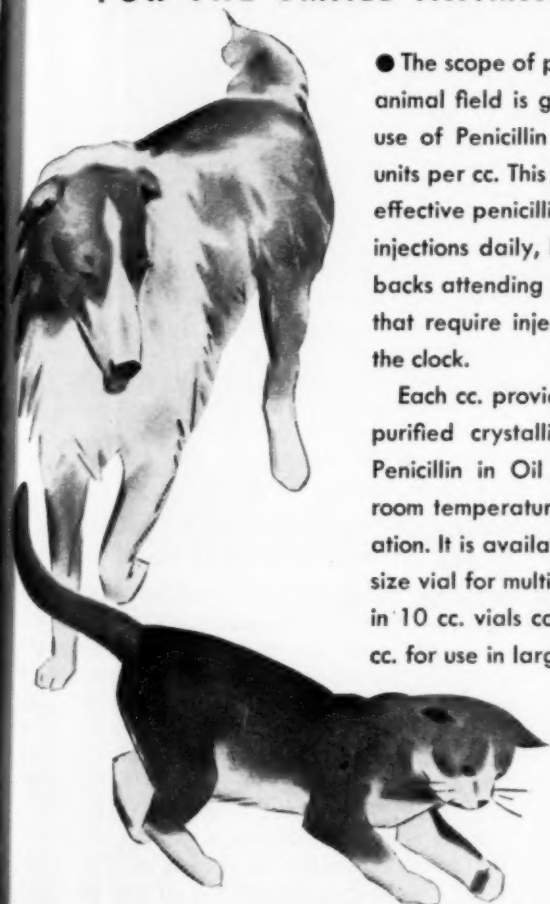
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Each cc. provides 100,000 units of highly purified crystalline penicillin G potassium. Penicillin in Oil and Wax is semiliquid at room temperature and requires no refrigeration. It is available in the economical 10 cc. size vial for multiple injections. Supplied also in 10 cc. vials containing 300,000 units per cc. for use in larger animals.



100,000 UNITS PER CC.

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Farm Animals in Political History

As everyone knows, animals occupied the earth for ages prior to the coming of the human race, or long before there were bureaus to play politics with them. When man finally arrived, everything was ready for his exploitations: land, streams, vegetation, and animals galore. Said Professor H. Magne, distinguished past-president of the veterinary academy of France, at its centenary celebration in the spring of 1946:

People who were not surrounded by animals fit for domestication remained backward and savage. Now, domestic animals are better characterized by permanent morphological types than the human race. Thanks to the animals, it is possible to follow and specify their replacements without error among the human populations who brought them along. . . .

As the JOURNAL has often said in the simple *patois* of the U.S.A., human populations well enough disciplined to specialize on the production of "permanent morphological types" of farm animals have been, and continue to be, the great nations of the world. But, the helofit is we have armchair economists who talk glibly about cutting out farm animals and raising more buckwheat.

Notes on the Protogene Family

Never heard of the protogenes? Then listen! They are the ancestors of all living creatures and by and large the slowest breeders of all the ages. The savants of modern times have cooked up the idea that their earliest progenitors mated only once in a million years or so and thereby delayed the arrival of the human race for a long, long spell. The start was like this: When the 96 chemical elements got to churning about to "make up" the face of the earth, 16 of the group ganged up on the rest and came up with something that could wiggle about on its own horsepower and have children. That sir, was the daddy of all living things—the protogenes. From here, the evolution of living creatures right up to 1948 contains a lot of interesting biologic facts.

Had the Iowa 4-H delegation not excelled in economic zoömetry they couldn't have captured the International stock judging prize. Who said there is no need of a veterinary science dictionary?

Friskies ALBUM OF CHAMPIONS



Ch. Romar Tanya · Ch. Romar Melinda · Ch. Romar Toni

CHAMPION

• These three champion Norwegian Elkhounds (Ch. Romar Toni subject to AKC confirmation) have won a total of 24 awards to date.

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All Champions...

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The owner of these fine Norwegian Elkhounds states that all three have been raised on Friskies exclusively.

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50, 25, 10, 5, 2 lbs.



Friskies Meal meets *every known nutritional need* for a complete balanced diet rich in essential proteins, vitamins, and minerals. Many well-known breeders commend Friskies as an excellent diet for mothers before whelping and while nursing the litter. It is also a preferred food for weaning puppies. Friskies is convenient to feed—and has a zesty, meaty taste dogs favor. In addition, this tested diet costs *less than half* as much to feed as most *camel* dog foods. Feed Friskies Meal and Friskies Cubes—for variety.

Keep your dogs frisky
with **Friskies**

A Carnation Quality Product

ADD FAT TO

HUNT CLUB

—then use less
fresh meat!



NO. **4** of a Series of Memos from W. E. ARMSTRONG to Hunt Club Veterinary Sales and Service Men

DOG FOODS DO NOT CONTAIN ENOUGH FAT. The University of Maryland's latest report, giving analysis of brands, exposes canned dog food having less than 1% fat; biscuit foods as low as 1.5% fat; a dog meal with only 1.9% fat! Such foods are dangerously low in fat.

DOGS NEED SUFFICIENT FAT. "Probably not less than 11% fat," reports U.S. Department of Agriculture Yearbook, "10% or more fat in the regular diet," reports Dr. McCay, Cornell University. Yet eleven brands of biscuit food averaged only 1.83% fat guarantee, according to the Maryland report.

HUNT CLUB DOG MEAL FORMERLY GUARANTEED 3.5% FAT. IT NOW GUARANTEES 5.0% FAT. There are two good reasons why HUNT CLUB is made with 5% rather than 10% fat.

**SAMPLE BAG
FREE**
...and money-
back trial offer

1st—There would be danger of rancidity in a dry dog food with a 10% fat content and the resulting loss in essential food factors.

2nd—5% fat is safe balance. It's easy to add an extra 5% fat to the daily diet of growing, breeding, show and hunting dogs when desired.

MERELY ADD 1 OZ. (2 TABLESPOONS) OF MELTED LARD PER POUND OF HUNT CLUB AND MEAT. Melt the lard, pour over the meal, add usual amount of water. Gradually, over 10 days, cut down meat to not more than 1 lb. meat to 4 lbs. HUNT CLUB. The mixture illustrated above is remarkable in its palatability, digestibility, utilization. It provides the 25% protein, 10% fat, 50% carbohydrate balance recommended by authorities. It supplies all 5 minerals. It furnishes all 6 necessary vitamins in excess of amounts indicated by Dr. Elvehjem, University of Wisconsin.

THIS MIXTURE COMBINES THE FAT FACTORS, ANIMAL PROTEINS, CARBOHYDRATES, VITAMIN CARRIERS, MINERAL SUBSTANCES essential to superior growth and development. It quickly "upholsters" dogs with the soft and hard fats needed for weight, top condition and mellow skins. Its animal fats provide essential, unsaturated fatty acids (also in wheat germ oil) which help lustre in coats—with perhaps 2.5 to 4 times more linoleic acid than beef fat. These fats help ovulation in females, fertility in males; also help in the utilization and absorption of calcium and phosphorus, especially from cereals. With enough fat, dogs get more food value, consume less food.

WE CHALLENGE INTELLIGENT VETERINARIANS TO TRY THIS HUNT CLUB MIXTURE 30 TO 60 DAYS. We have tested, proved it in our own kennels. But we feed it without the addition of fresh meat because, frankly, our tests show HUNT CLUB and lard alone provide all the animal protein, fat, carbohydrates, vitamins and minerals dogs need. The value of fresh meat lies, therefore, primarily in "taste value" when dogs are accustomed to it.

We will supply facts on dog feeding if requested.

W. E. ARMSTRONG

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Date _____

- ☐ Send free sample bag, all charges paid.
- ☐ Explain offer to feed my kennel 30 days on your "Satisfaction or Money Back" proposition. (East of Rocky Mountain area only.)

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Do you feed meat? _____ Meal? _____ or Biscuit? _____

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FOR TREATMENT OF AND PROTECTION
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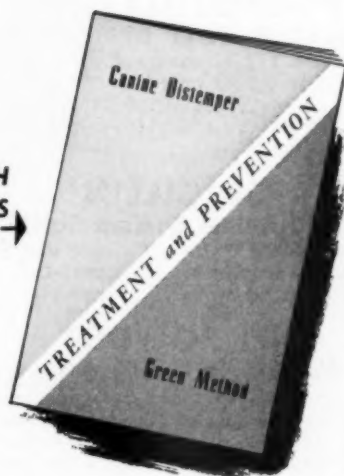
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150 lb. drum.....	58½c per lb.

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100,000 Oxford Units.....	per vial \$.30
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1 lb. can (12 to case).....	49c per lb.
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Increased Enrollment in Pharmacy Colleges.—The current enrollment in 65 accredited pharmacy colleges totals more than 18,000 undergraduates and more than 300 graduate students, or an increase of 20 per cent over 1946 autumn enrollment. The Committee on The Pharmaceutical Survey, American Council of Education, has alerted the schools and boards of pharmacy to the need for a careful adjustment of student admissions to avoid a probable oversupply of pharmacists, beginning not later than 1951.

New English Terms

"Ten Eventful Years," 4-volume supplement to the *Encyclopedia Britannica*, publishes a list of several hundred out of thousands of new terms which came into general use in the English language during the period 1937-1946,—a period of unrest, dissatisfaction, conflict, and discovery. Exclusive of the many scientific words, the following are chosen at random:

inductee	goon	lend-lease
conscriptee	grass roots	wonder drug
selectee	bank night	stockpile
rejectee	bund	gremlin
returnee	Quisling	Oscar
blackout	hit-and-run	beachhead
dust-bowl	jitterbug	ack-ack
candid camera	screwball	blind landing
court packing	sit-down strike	chemurgy
fifth column	newscaster	terminal leave
baby sitter	radar	jet propulsion
glamour girls	teen-ager	gas hog
denazification	bazooka	shooting war
iron curtain	car pool	paratrooper
backstage	parachuter	oomph girl
Dunkirk	on-the-beam	Gestapo
Munich	blitzkrieg	good-neighbor
escapism	price ceiling	policy
captive mine	Hitleristic	

Pages would be required to list all of the general and scientific words coined and put to use in the last ten years.

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... in small animal anesthesia

For over seventeen years, clinical reports have favorably commented on the efficacy and anesthetic value of Nembutal Sodium in small animal surgery. A notable record started in 1930, when investigators reported on its safe and satisfactory use as a surgical anesthetic in 500 dogs¹.

The record continued through the years, substantiating the many advantages of Nembutal Sodium anesthesia—the prompt effect, the profound hypnosis of moderate duration, the ease of intravenous administration. Only recently it was reported² that Nembutal Sodium anesthesia provides more ideal working conditions for the surgeon,

permitting him to give his undivided attention to the operation, eliminating breaks in technic and enhancing asepsis . . . factors on which, to a great extent, the ultimate recovery of the patient depends. This record, 1930 to 1948, has established Nembutal Sodium as the *preferred* surgical anesthetic for all operations in small animals.

Nembutal Sodium Sterile Solution is available for your use in 20 cc. and 100 cc. containers. If you would like further information on Nembutal Sodium as an anesthetic agent and its other uses, address a card or letter to Veterinary Dept., ABBOTT LABORATORIES, North Chicago, Ill.

Nembutal[®] Sodium

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(PENTOBARBITAL SODIUM, ABBOTT)

1. Mayo, N. S. (1930), *The Use of Nembutal on Dogs*, *North Amer. Vet.*, 11:46, Dec. 2. Leonard, E. P. (1947), *Improved Intravenous Anesthesia for Small Animals*, *J. Amer. Vet. Med. A.*, 111:37, Jul.



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Names of classified advertisers using key letters cannot be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Positions

Desire permanent position as assistant to small animal practitioner in Western United States. Graduate of recognized college. Some experience. Address "Box U 6," c/o Journal of the AVMA.

Veterinarian interested in partnership or practice in eastern Pennsylvania or New Jersey. Licensed in both states. Teaching and practice experience. Address "Box R 10," c/o Journal of the AVMA.

Graduate with 3 years' experience desires 6 to 12 months "postgraduate work" with outstanding cattle, swine, or small animal practitioner. Have car, complete equipment, Illinois and Missouri licenses. Address "Box U 7," c/o Journal of the AVMA.

Graduate veterinarian with six years' experience desires position or positions for summer months. Now attending medical school, single, will travel. Address "Box U 16," c/o Journal of the AVMA.

Senior veterinary student attending Michigan State College desires assistantship in mixed practice for the summer vacation. Address S. Howard Padwee, Box 428, East Lansing, Michigan.

Mature veteran desires to continue "on the job training" as veterinary aid or assistant with permanency in view. Capable of handling most jobs in small animal hospital short of graduate veterinary work. Two years college, two years with small animals. Excellent references. California only. Address "Box U 18," c/o Journal of the AVMA.

Young English graduate wishes to see practice and gain experience with American or Canadian practitioner, commencing about July for six months. Large animal or mixed practice. In view of currency difficulties, work for keep. Address "Box U 23," c/o Journal of the AVMA.

Senior student, Ohio State, wishes a position as assistant in small animal hospital June to October. References available. Paul Brehm, 2317 Adams Ave., Columbus, Ohio.

Experienced protestant graduate of recognized school seeks assistantship in outstanding small animal practice with opportunity to buy building and practice. Dr. Lewis Marion, 9115 Ogden Ave., Brookfield, Ill.

Wanted—veterinarians

Connecticut—excellent opportunity for veterinarian who is competent of assuming complete charge of small animal hospital. Must be able to handle every phase of management including surgery, medication, hospital records, etc. Please don't reply unless you are qualified and experienced. Write complete history of yourself, education, and hospital experience. Address "Box U 9," c/o Journal of the AVMA.

Veterinarian for direction of pharmaceutical and biological sales and editorial work by nationally prominent commercial firm, selling to

(Continued on page 40)

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Original formula 107-A



BE READY at all times to save puppies that might otherwise be lost. **ESBILAC** conforms almost exactly to the chemical pattern of natural bitch's milk and gives similar feeding results.

Also an efficient feeding supplement for pregnant bitches, lactating bitches, weaning puppies, convalescent dogs, aged dogs.

LIKE BITCH'S MILK

Bitch's milk contains about twice the fat and protein of cow's milk. That's why **Esbilac**, which closely resembles bitch's milk in composition, proves superior to formulas using cow's milk for feeding puppies. The **Esbilac** formula (original formula 107-A) has been used successfully for nearly 10 years.

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NOT A MEAT SUPPLEMENT BUT A COMPLETE MEAL IN ITSELF



Contains twice minimum vitamin requirements, contains milk solids, 14 other highly nutritious ingredients including high-quality meat-meal. Appetizing, inexpensive. At your dealer's in 2, 5, 10, 25 and 50-lb. bags.

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THE KIRSCHNER-EHMER SPLINT

completely tried and tested, is rapidly becoming a MUST with more Veterinary Surgeons.

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The Best... Check These Important Advantages:**

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Send me generous FREE sample of Kasco
Complete Dog Ration.

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"You can take off on a plane and fly the air like a bird or you can take a submarine and swim the sea like a fish. Now all there's to do is to use your legs and walk the land like a man."—*The rearrangement of a Stolen Thought.*

Mortality Rate.—"Mortality rate" is not a stupendous blunder in medical writing. It is only a little mistake when used to indicate the ratio of death to recovery of a given disease. But the good writer says "mortality" and saves the price of printing a superfluous four-letter word.

Succedaneum Tabaci.—Comes news from abroad that the blocked currency has stopped the importation of tobacco to such a degree that other plants are taking its place. The leaves of coltsfoot (*Tussilago farfara*) are smoked in long pipes to avoid burning the tongue. The Germans and others are smoking a mixture of cherry leaves, hops, and woodruff (*Asperula odorata*) which rolls into skags like Duke's Mixture and has the advantage of burning and tasting like sawdust. What the commentators are saying over the radio to put these over is omitted in the dispatches.

Notice to Contributors

Journal of the AVMA and the *American Journal of Veterinary Research*

Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies also should be typed double space and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

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HOTEL RESERVATIONS—SAN FRANCISCO SESSION

Eighty-fifth Annual Meeting, American Veterinary Medical Association

Aug. 16-19, 1948

A Housing Bureau has been organized for the San Francisco session. All requests for rooms will be handled in chronological order; therefore, send in your application as early as possible.

Use the form below and be sure to indicate your first, second, and third choice hotel. Because of the limited number of single rooms available, you will have a better chance of securing accommodations if request is for rooms to be occupied by two or more persons. Rates quoted are for the room; in case of double occupancy, the rate will be shared.

All requests must be accompanied by a deposit check for \$5.00 per person or \$10.00 per room, made out to "AVMA Housing Bureau." Due to crowded conditions, hotels cancel unclaimed reservations by 6:00 p.m. Therefore, to avoid any misunderstanding, the deposit holds the room on your arrival day—whatever the hour. Bring your confirmation slip or cancelled deposit check as proof of reservation.

All reservations must be cleared through this Housing Bureau. All requests must give definite date and approximate hour of arrival and departure; also names and addresses of all persons who will occupy rooms. All reservations will be confirmed if request is received not later than Aug. 1, 1948.

Schedule of Hotel Rates—See Locations on Opposite Page

Hotel	Single	Double Bed	Twin Beds	Parlor Suite	2-Bedrm. Suite (Connecting Bath)
*Bellevue	\$5.00	\$6.00	\$10.00		
*Canterbury	\$4.00-\$5.00	\$4.50-\$6.00			
Chancellor	\$4.00	\$4.50			
Cliff	\$6.00-\$8.00	\$7.00-\$10.00	\$12.00-\$15.00		
Commodore		\$5.50-\$7.50			
*Drake-Wiltshire	\$3.50-\$4.00	\$5.00			
*Embassy	\$3.50-\$4.00	\$3.50-\$4.00			
Fairmont		\$6.00-\$10.00	\$18.00-\$22.00		
Mark Hopkins	\$7.00-\$9.00	\$10.00-\$14.00	\$20.00-\$30.00		
Palace	\$8.00-\$11.00	\$8.00-\$11.00	\$14.00-\$20.00		
Plaza	\$5.00-\$6.00				
*St. Francis	\$8.00-\$10.00		\$18.00		
*Sir Francis Drake	\$8.00-\$10.00	\$9.00-\$12.00			
Stewart	\$4.00-\$4.50	\$4.50-\$5.00	\$9.00		
*Whitecomb	\$6.00-\$9.00	\$7.00-\$9.00	\$12.00-\$27.00	\$11.00-\$13.00	

*Charge for each extra person in room, \$1.00 to \$2.00 per day.

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Date

Please make reservations noted below:

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Twin Bed Room.....Rate.....
Parlor SuiteRate.....
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NameAddress

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(Continued from page 34)

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Assistant to take charge of old, established small animal practice in New Jersey. Must be willing to work. State qualifications, school, experience. Submit photo and references. Address "Box U 12," c/o Journal of the AVMA.

Recent graduate or college senior for mixed practice in central states. Rare opportunity, good salary. Give full particulars, age, nationality, marital status, any lodge or church affiliation, and references. Address "Box U 11," c/o Journal of the AVMA.

Graduate veterinarian of an accredited college, preferably single, as an assistant in a small animal hospital in large midwestern city. State experience, age, and college. Address "Box U 14," c/o Journal of the AVMA.

Graduate veterinarians, not over 45, preferably with some experience in meat inspection. Bureau of Animal Industry regulations effective. Starting salary \$250 per month, vacation and sick leave time, pension plan with retirement benefits. One position with the background of BAI experience in floor inspection and meat processing, starting salary \$265. Give full particulars, age, references, etc., when answering. Jefferson County Board of Health, Food and Dairy Inspection, 600 S. 20th St., Birmingham, Alabama.

Three additional veterinarians being added to our present staff. An excellent opportunity for graduate veterinarians to gain experience in regulatory work. Starting salary \$275 per month. Address: Oregon State Civil Service Commission, 444 Center Street, Salem, Oregon.

Veterinarian, graduate of recognized college as assistant in small animal hospital in northern Ohio. Unusually good opportunity. Good starting salary. Give full particulars in first letter. Address "Box U 19," c/o Journal of the AVMA.

Excellent opportunity, choice small animal practice. Prefer young, married, California-licensed veterinarian. Salary and percentage. Dr. S. M. Dingwall, 7477 Girard Avenue, La Jolla, Calif.

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Colorado graduate, 1944, desires to locate in Rocky Mountain area. Experienced in large and small animals. Would consider purchasing practice or permanent association. Address "Box U 1," c/o Journal of the AVMA.

Experienced, young graduate of recognized college wishes to purchase mixed practice (50 per cent or better dairy) in town of 10,000 or larger in Maryland or Virginia. Please give all details in first letter. Address "Box U 4," c/o Journal of the AVMA.

Young, experienced, married veteran, graduate of accredited college, desires to purchase or lease practice in Westchester County, New York. Address "Box U 5," c/o Journal of the AVMA.

Experienced veterinarian desires location for practice, preferably large animal, in Pacific Northwest. Will consider any desirable proposition with view toward the future. Address "Box U 24," c/o Journal of the AVMA.

Desire location for general practice, mostly large animal, after July 1. In eastern or south-eastern states. Experienced. Will buy or lease. Address "Box U 26," c/o Journal of the AVMA.

For Sale or Lease—Practices

FOR SALE—Dairy practice in southern Minnesota city of 35,000 population. Also excellent

(Continued on page 42)

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These are the ingredients it contains

Animal Proteins. Larro derives its animal proteins from a selected meat and bone meal, fish meal, animal liver and glandular meal, and dried buttermilk.

Total Proteins. These animal proteins are further supplemented by vegetable proteins from choice soybean oil meal and from corn oil cake, both of which also contribute desirable physical properties to the mixture. From all ingredient sources combined, *each pound of Larro Dog Food supplies about 1½ times as much total protein as one pound of average, good, fresh beef meat.*

Cereal Products. Energy values are liberally contributed by cooked whole wheat flakes, toasted yellow corn flakes and rolled oats. While it has now been definitely proven that dogs can utilize raw starches, each of these three cereal products has been processed to make them quickly and completely available to digestion. The inclusion of barley malt supplies starch digesting enzymes.

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Vitamin Products. Several of the ingredients mentioned are excellent sources of vitamins. However, the already rich provision for such vitamin factors as vitamins A and carotene, of riboflavin, and others is still further fortified by the use of wheat germ, of irradiated brewers' type yeast and of a fortified vitamin A and D oil.

The combination of all these ingredients produces a high palatability—unusual in dry dog foods.

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(Continued from page 40)

opportunity for a good small animal practice. House, lot, and garage included; also supply of drugs and equipment. Address "Box U 3," c/o Journal of the AVMA.

FOR SALE—Mixed practice with fully equipped and modern small animal hospital. Room for 30 dogs. Nice apartment. Northern California. Gross in 1947, \$18,000. Price \$17,000, \$10,000 down and balance on terms. Address "Box U 2," c/o Journal of the AVMA.

FOR SALE—California location. Small animal hospital, fully equipped, including x-ray; property, improvements, good will. Wire or write CLEMMER W. WISE, 1960 Bird Street, Oroville, California.

FOR SALE—Mixed practice, modern six room home and hospital (15 kennels) in one of the best dairy sections of southern Michigan. Reason for selling, ill health. Address Dr. J. H. Boyd, Clayton, Michigan.

FOR SALE—Small animal hospital in Los Angeles, established 30 years. Located on main thoroughfare, lot 50x150, hospital fully equipped, handles 50 animals, room for expansion, 5 room house on premises. Address "Box U 13," c/o Journal of the AVMA.

FOR SALE—Thriving long-established general practice in rich eastern Iowa territory. Annual gross, \$20,000. With or without real estate. Address "Box U 15," c/o Journal of the AVMA.

FOR SALE—Veterinary practice and boarding kennel. Large house and about 1 acre of ground. Hospital set up in large basement. Plenty of room for expansion. Suburb of New York City, city of 75,000. Asking only value of the real estate. Address "Box U 20," c/o Journal of the AVMA.

FOR SALE—Well-established mixed practice in Ohio. Substantial income from Public Health work in addition to that derived from practice. If office and residence are not desired, practice may be purchased for actual inventory of drugs and instruments. Address "Box U 21," c/o Journal of the AVMA.

FOR SALE—Mixed practice in western Pennsylvania. Perfect spot for beginner or veteran and wife. \$6,500 including four room house, kennels, 500 square miles to service. Address "Box U 22," c/o Journal of the AVMA.

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FOR SALE OR LEASE—California small animal practice, house included. Small, rapidly growing practice with good deal to right man. Little cash needed. No good will. Address "Box U 27," c/o Journal of the AVMA.

FOR SALE—Modern small animal hospital. Lucrative rapidly growing practice in good New Jersey suburban location. Substantial down payment required. Address "Box T2," c/o Journal of the AVMA.

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ARTIFICIAL INSEMINATION INSTRUMENTS—Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

Miscellaneous

FOR SALE—One new unused Kirshner-Ehmer Splint complete with Gordon Extender. Original price \$139.80. Sale price \$123.00. Address "Box U 17," c/o Journal of the AVMA.

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Keep up on dog breeds and breeding matters, shows, type, etc. Dog World mo., \$3 one yr., \$5 two yrs., \$10 5 yrs. Judy Publ'g Co., anything in dog books, kennel blanks, 3323 Michigan Blvd., Chicago 16.

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Psychiatrie Vétérinaire.—To be successful in the practice of veterinary medicine, one must know everything from the innermost quirk of the animal's instinct to the uppermost warp of the owner's mind.—*Talliremal.*

Romantic Upsurge.—Quick-frozen chicken and turkey, dressed and ready to serve, packed in sanitary packages was a 12 million-lb. business in 1937. By 1941, the figure had mounted to 75 million lb. The estimate for 1947 is 193 million lb. A marketing technique by which consumers are provided whole or parts of birds cut up in tasty morsels ready to prepare for the table seems bound to replace a larger and larger proportion of the poultry future populations will eat.

Feather-Picking Device.—According to the Institute of American Poultry Industries, practically all of the feathers can be removed from poultry by a newly patented water-spray device. The bird hangs head down in a frame that grips the head, wings, and feet and that turns on its vertical axis between water pipes fitted with nozzles that spray against the grain of the feathers. Hot water is sprayed under 75 lb. of pressure to soften the feathers, after which water at about 85 F. is applied under 150 lb. of pressure.

Veterinary Medical Association of Boston

There was a municipal veterinary medical association in Boston in the 1850's. Quoting from *American Veterinary Journal*, June, 1858, page 191: "At a meeting of the Association [*loc. cit.*] lately held in this city the following officers were elected for the ensuing year: Prof. C. M. Wood, *president*; Prof. Robert Wood, *vice-president*; Prof. A. S. Copeman, *corresponding secretary*; E. F. Thayer, *secretary*." All of these men became charter members and past-presidents of the AVMA.

At this meeting, the report goes on to announce, W. W. Frailey, R. Jennings, A. Tegtmeier, and R. Evans, of the Philadelphia Veterinary Association, were elected honorary members, together with all of the faculty of the Royal Veterinary College of London.

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Sulfathalidine *phthalylsulfathiazole*, Sharp & Dohme's newest sulfonamide, is exceptionally efficient against swine enteritis, and is given orally *just once a day!*

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No. 2267—¼-lb. and 1-lb. bottles of powder.

1. Vet. Med. 42:170, May 1947 2. N. Am. Vet. 27:564, Sept. 1946; J. Am. Vet. M. A. 107:338, Oct. 1946; J. Am. Vet. M. A. 109:7, Jan. 1948

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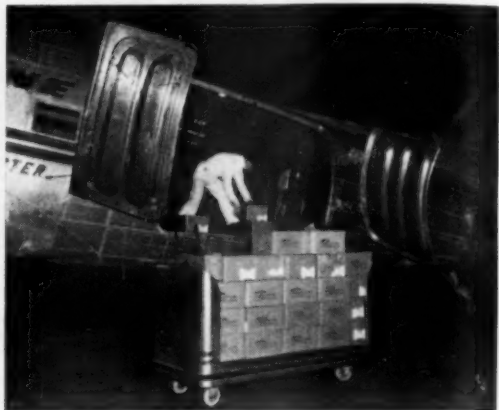
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Veterinary Division

Jen-Sal Expansion.—The laboratories of Jensen-Salsbery, producers of veterinary biological, pharmaceutical, and surgical products, are to be expanded by a 10,000



Bound for South America, a transport plane at the Kansas City Airport is being loaded with a large shipment of Crystal Violet Hog Cholera Vaccine produced by Jensen-Salsbery Laboratories, Inc.

sq. ft. addition at the present location, 21st and Penn streets, Kansas City, Mo. This addition will afford greater production of pharmaceutical products.

Increased production in the Biological Department will result from an additional 90-acre tract of pasture land in Johnson County, Kansas, where horses and cattle can be maintained during the hyperimmunization period, and with a modern bleeding and injection building for horses.

Death of John Hervey.—John Hervey, 79, fluent writer and turf editor of the light harness horse field, died at his home in Chicago in December. His last article was a memorable illustrated biography of Budd Doble, Orrin Hickock, John Splan, and the Gornsmith brothers, published in the deluxe Christmas issue of the *Harness Horse*. The article related thrilling experiences of such famous trainers and reinsmen and such equine prodigies as Joe Patchen, Nancy Hanks, Rarus, and Goldsmith Maid, whose names are inscribed indelibly in the annals of the Standardbred. John Hervey, a native of Ashtabula County, Ohio, spent his early life with the Fasig stables of New York City, edited the old *Horse Review*, and ended by writing a weekly story in the *Harness Horse*.

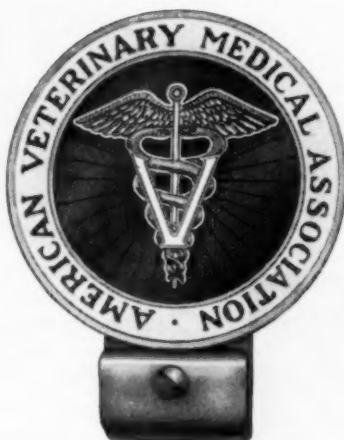
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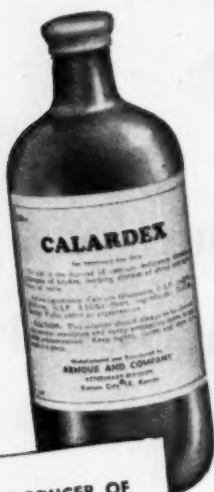
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Certain pathological conditions require more than intravenous calcium medicinals. In such cases, this solution—combining both calcium and magnesium therapy—is highly effective.

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The human body uses calcium to form and maintain bones and teeth, to coagulate blood, to maintain normal heart action, and to keep muscles and nerves functioning properly.

New Product for Liver Fluke Control.—Fine Organics, Inc., New York City, has announced the production of a "new product for the effective and economical destruction of liver flukes in cattle, calves, and sheep," called Anti-Liver Fluke F.O. The Bureau of Animal Industry, USDA, recommends the use of the active ingredient of Anti-Liver Fluke F.O.

Fateful Coincidence.—The absurd paradox of this period is constituted by the prodigious achievements of medicine on the one hand and the destructive fury of war on the other. That such miracles should be performed in the alleviation of human suffering and the preservation of life while war spreads disease and death is a frightful coincidence.—*The Rev. Ralph Cooper Hutchison, Centennial Religious Services of the American Medical Association meeting in Atlantic City, N. J., June 8, 1947.*

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A stable injectable solution for subcutaneous, intramuscular or intravenous administration. Ready for use as supplied.

Each cubic centimeter contains:

- Vitamin B₁ (Thiamin Hydrochloride) . . 10 mg.
- Vitamin B₂ (G) (Riboflavin) 2 mg.
- Vitamin B₆ (Pyridoxine Hydrochloride) . . 5 mg.
- Nicotinamide (Niacinamide) 50 mg.
- Pantothenic Acid (as the Sodium Salt) . . 10 mg.

Supplied in 10-cc. Steri-Vials®
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Provides a convenient and rapid method of supplying the five principal factors of the B complex. Particularly suitable when oral therapy is not practical or where the rapid utilization of Vitamin B factors is desirable.

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Origin of the syringe dates to around 1000 A.D. when Albucasis, an Arabian physician, described an instrument composed of a copper plunger inserted in a cannula.—*J. L. Switzer in Medical Times.*

Nose-prints of dogs correspond to fingerprints of man; veterinarians say that every dog's nose is different and that their nose-prints are valuable for identifying valuable animals.—*Science Digest.*

On the Chincha Island off the west coast of Peru, the cormorant, the Guanay, drops annually 170,000 tons of guano. The Guanay, which eats some 60 fish per day and deposits about 11 lb. of guano per year, is protected and managed like livestock by the Peruvian government.

That Deceptive Terminology.—"The cattle fever tick," says *Science Digest*, "once cost American farmers tens of millions of dollars, and now you'd have a hard time finding one such insect for a museum." The credit is given to the entomologists, bless their achievements, but (beg pardon) in this particular case, a couple of veterinarians of the U.S. BAI gave the entomologists a hunch on insects that no one had dreamed of before. On and on we pay a high price for having shopped around for an alias more glorious than *veterinarian*.

The First Zoos.—The exhibition of captive wild animals for entertainment was practiced by the Chinese 1100 B.C. The Germans, once leaders in the zoo field, were outstripped by Americans in recent years. The Bronx Zoo of New York City is the largest of all zoos and has the greatest variety of animal exhibits, and the Brookfield Zoo of suburban Chicago is said to be the finest. The first American zoo was the one at Philadelphia, established in 1859. As amusement of the highest type for children—and adults—the zoo is without a near rival.

THE SEVERE OUTBREAK OF EQUINE ENCEPHALOMYELITIS

in the south-central district late in the season of 1947 has served to emphasize the desirability of preseasonal immunization against this disease.

While most parts of the infected districts of the United States had relatively few cases, some of the disease was encountered in all known infected areas in 1947.

The only sure way to prevent heavy loss from this disease is practicing widespread vaccination ahead of the season when insect vectors are abundant. There is no area in the United States where horses are safe unless vaccinated.

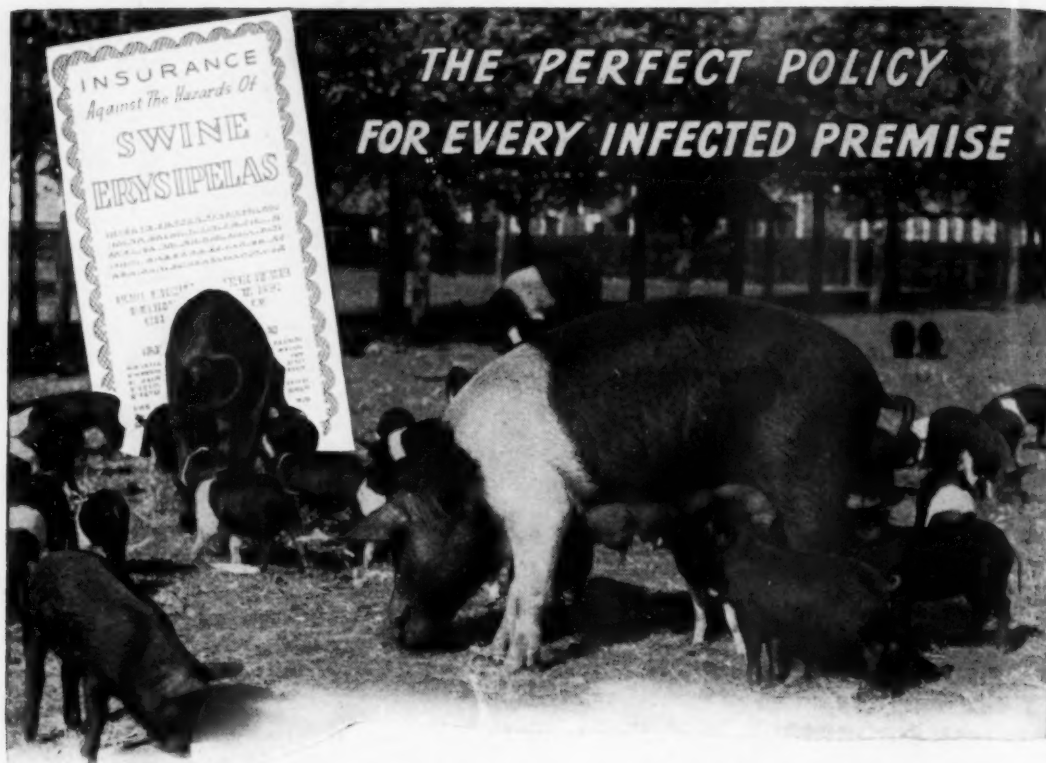
1948 Encephalomyelitis Vaccine (Lockhart) is ready for distribution, and adequate supplies are available either direct or through reputable jobbers throughout the United States.

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DIMON: Vial 100 cc.....	\$2.25
DIM: Vial 250 cc.....	5.00

E. Rhysiopathiae Vaccine

(Living Culture)

Code	
ERSAL: Vial 5 cc.....	\$.80
ERSEP: Vial 15 cc.....	2.00

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